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ABSTRACT

This four-chapter manual outlines suggested curricula for two agricultural programs: Agricultural Science and Mechanization, which is designed to accommodate the requirements of the Veteran's Pension and Readjustment Assistance Act of 1967; and the Agricultural Science Program, which includes a general education component required for the Associate of Applied Science Degree. The manual is the result of a curriculum development project undertaken by the North Carolina Department of Community Colleges to align vocational curricula with valid, on-the-job performance requirements. After detailing the objectives of each program, Chapter I discusses guidelines for faculty selection and certification, and then evaluates program needs in terms of facilities, equipment, instructional materials, library service, and liaison activities with professional associations concerned with production agriculture. Chapter II details activities undertaken during the curriculum development project, including a statewide survey to assess agricultural career opportunities; the identification of tasks performed in each occupation; and an analysis of each task to distinguish requisite competencies. Job descriptions and associated tasks for 24 agricultural occupations are presented in Chapter III, while Chapter IV provides a quarter-by-quarter outline of courses for each program, along with course descriptions. Appendices detail survey results and the competencies associated with identified tasks. (JP)

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# T-126 AGRICULTURAL SCIENCE
# T-017 AGRICULTURAL SCIENCE AND MECHANIZATION

## A COMPETENCY-BASED CURRICULUM MANUAL

September, 1980

Coordinated by
Coy L. Hudson
Department of Community Colleges

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OCCUPATIONAL PROGRAM SERVICES
DEPARTMENT OF COMMUNITY COLLEGES
RALEIGH, NORTH CAROLINA

# FOREWORD

This curriculum manual was developed by using a competency-based curriculum model to determine specific employment requirements of graduates entering agricultural production and agricultural production related jobs. The Agricultural Science and Agricultural Science and Mechanization Curriculum Manual represents an effort coordinated by the Department of Community Colleges to update the two curriculums using performance competencies as a basis for determining curriculum content and objectives. The materials contained in this manual were developed, reviewed, and approved by the committee members composed of agricultural production instructors in various community colleges, technical colleges, and technical institutes in the North Carolina Community College System and farm owners, managers, and workers.

The Department of Community Colleges encourages institutions to continually review and update curriculums in order for students to receive instruction relative to employment requirements. Therefore, this curriculum manual should be used by institutions in the North Carolina Community College System to update their current Agricultural Science and Agricultural Science and Mechanization curriculums and by institutions planning to offer new curriculums. Following the guidelines in this manual with the assistance of a local advisory committee, institutions should be able to offer effective programs that meet employment needs. Staff of the Occupational Program Services and the Agricultural Science and Agricultural Science and Mechanization Competency Committee recommend the materials contained in this manual to you.

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## ACKNOWLEDGEMENTS

Thanks and appreciation are extended to the many individuals who contributed to the development of this manual. This publication would not have been possible without their assistance and cooperation.

The competency curriculum committee members were composed of community college, technical college, and technical institute Agricultural Science and Agricultural Science and Mechanization instructors. The members of this committee met numerous times and developed the materials contained in this manual. Without the interest, support, and dedicated efforts of these instructors, this publication would not have been completed. Special recognition is extended to these committee members.

Dennis Bailey, Johnston Technical Institute
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John German, Wilkes Community College
Charles Griffin, Nash Technical Institute
Steve Mathis, Sampson Technical College
John Merritt, Southeastern Community College
Joe Parsons, Central Carolina Technical College
Sherwood Peacock, Sampson Technical College

Appreciation is expressed to the farm owners, managers, and workers, many who were enrolled in the Agricultural Science and Mechanization curriculum, who responded to the job and task surveys for the validation of the materials. Their responses validated the work of the curriculum committee and add credibility to the materials provided in this manual.

To Mr. Larry Beckham and Mr. Leonard Williams, paid consultants for the project who revised many of the competency statements and criterion measures developed by the curriculum committee, appreciation is expressed for their valuable contributions.

A special thanks and recognition is given to Mrs. Laurel Pearce, Secretary for the Project Coordinator, for coordinating all correspondence concerning the manual, for typing the manuscript, for coordinating and participating in the proofing of the manuscript, and for providing assistance in decision making and other matters.

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# CHAPTER I

## INTRODUCTION

The Agricultural Science and Mechanization curriculum, T-017, is a technical specialty program that is designed for individuals who are engaged in or who are interested in becoming engaged in production agriculture. The program is set up to accommodate the requirements of the Veterans Pension and Readjustment Assistance Act of 1967, Public Law 90-77, and the amendments contained in Public Law 93-508, United States Congress. These laws provide for the establishment of Farm Cooperative Training Programs through public school systems and post-secondary or community college systems for veterans who have been in the military services of the United States at anytime since February 1, 1955. Veterans who are enrolled in the Agricultural Science and Mechanization curriculum and who are engaged in production agriculture (farming) on a full-time basis are eligible to receive an educational assistance allowance at the appropriate rate provided by legislation provided the institutional courses are relevant to the individual's farming operation as determined under standards prescribed by the Veterans Administration. To receive the educational assistance allowance, an eligible veteran must be enrolled in an approved Agricultural Science and Mechanization program consisting of institutional agricultural courses for a minimum of five (5) clock hours per week for a half-time program, seven (7) clock hours per week for a three-quarters time program, and ten (10) clock hours per week for a full-time program. For more detailed information on other requirements of the program and approval procedures by the Veterans Administration, see the following publication available from Dr. Coy Hudson, Department of Community Colleges: North Carolina State Plan for Veteran's Cooperative Farm Program.

The Agricultural Science Program, T-126, is related closely in purpose and content with the Agricultural Science and Mechanization program. Since the Agricultural Science and Mechanization program is required by the Veterans Administration to offer only agricultural courses, no general education courses are included in the curriculum. Therefore, the Agricultural Science program was initially developed for institutions to be able to offer individuals completing the Agricultural Science and Mechanization program an opportunity to receive an Associate of Applied Science Degree by offering them a minimum of eighteen hours of general education. The Agricultural Science program provides additional flexibility in that a complete two-year production agriculture program may be developed by the institution and students can enroll in the program the first quarter and continue until they receive the Associate in Applied Science Degree.

## Curriculum Implementation

This manual is available to aid institutions wishing to update their Agricultural Science and Mechanization and Agricultural Science curriculums as well as for institutions wishing to plan and implement these curriculums. Information provided in the manual includes a suggested curriculum by quarters, course descriptions, entry level and advanced level job opportunities, tasks, competencies, and criterion measures. All information should be used by institutions to assist in focusing the instructional activities of the curriculum and in determining competencies of students, both graduates and early leavers. It is recommended that local advisory committees review the manual and select courses and tasks to be taught that meet the employment needs in the service area of the institution.

## Curriculum Design

The Agricultural Science and Mechanization program is somewhat unique because of the special requirements of the Veterans Administration and the clientele the curriculum serves. Students enrolled full-time in the program normally attend classes ten (10) contact hours per week. Classes are normally taught in the late afternoon or evening and students attend two to three days per week. The length of the curriculum is usually forty-five (45) months. A diploma is awarded to the individuals who successfully complete the program.

Courses in the program are designed and taught so that students may enroll at the beginning of any quarter. Administrators and instructors should select and design courses that are relevant to the type of production agriculture currently in practice in the area and the type projected for the next several years.

The Agricultural Science program, as indicated previously, may be the vehicle whereby graduates of the Agricultural Science and Mechanization program can obtain their Associate Degree. It is the institution's prerogative if credits in the technical specialty Agricultural Science and Mechanization program will be accepted in the Agricultural Science program. Both programs must have State Board of Education approval before they can be offered.

The Agricultural Science program may also be designed as any Associate Degree program with classes scheduled for six, seven, or eight quarters. This type of program may be offered along with the Agricultural Science and Mechanization program. With good planning and a determination of the agricultural production curriculum needs for the area, these two programs provide an excellent opportunity for institutions to provide the skills, knowledge, and attitudes required for students to become successfully employed in farm and production agriculture related occupations.

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## Faculty and Staff Selection and Certification

The effectiveness of any educational program depends to a large extent on competent, well qualified, highly motivated instructors who have a desire to teach. This is especially true in the community colleges, technical colleges, and technical institutes because of the large numbers of low ability, disadvantaged students who attend these institutions. It is necessary for faculty and staff to understand the unique nature and role of the comprehensive institution.

Formal certification of faculty members by the Department of Community Colleges is not required. However, the North Carolina Administrative Code; Title 16, Department of Public Education; Chapter 4; Department of Community Colleges; Subchapter 4C, Section .0202 indicates that:

(1) . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .

(2) Institutions shall employ faculty members so as to meet Southern Association of Colleges and Schools standards, and the State Board of Education's Standards and Evaluative Criteria, as amended.

(3) Institutions shall determine appropriate teaching and non-teaching loads for faculty and for technical assistants to the faculty so as to meet Southern Association of Colleges and Schools standards and the State Board of Education's Standards and Evaluative Criteria, as amended.

Instructors of the Agricultural Science and Mechanization and Agricultural Science programs should be able to carry out the objectives of the programs and to plan, implement, and evaluate learning experiences essential to the programs. Instructors should be well informed of the requirements for employee competency in jobs for which students are being trained so instructors can utilize resource people, field examples, and illustrations as supporting materials in their courses. Faculty members should also be able to counsel students, work with individuals and organizations within the community and, through research, continuing education, and/or professional organizations be aware of the changes developing in the production agriculture industry.

As indicated above, teaching loads of faculty should adhere to the standards of the Southern Association of Colleges and Schools and the State Board of Education's Standards and Evaluative Criteria. However, factors to consider in determining teaching and non-teaching work loads for Agricultural Science and Mechanization and Agricultural Science instructors include: (1) teaching loads of other instructors in other curriculum areas in the institution, (2) class contact hours, (3) number of preparations, (4) student loads, (5) committee assignments, (6) departmental responsibilities, and (7) other special duties. A full-time load is usually considered to be from 12 to 25 contact hours per week.

It is essential that Agricultural Science and Mechanization and Agricultural Science instructors have a knowledge of community development, know how to work and get along with citizens in the community, and be able to form and coordinate a local advisory committee made up of representatives of the production agriculture industry in the community and/or region. Much contact is required of instructors with employers, employees, and other individuals if a quality program is to be offered.

## Facilities, Equipment, and Instructional Aids

### Facilities

Adequate instructional facilities consisting of classrooms, laboratories, storage facilities, and outdoor laboratories are necessary for community colleges, technical colleges, and technical institutes to provide quality programs for Agricultural Science and Mechanization and Agricultural Science.

Classrooms are needed to provide the lecture and discussion part of courses. The number and size of classrooms will depend on student enrollment, curriculum design, methods and media used in instruction, and whether the classrooms will be used by students in other programs. Classrooms should be attractive, clean, and well lighted, ventilated, heated, air conditioned, and acoustic-proof. Chalkboards, electrical outlets, and means of darkening the room for audiovisual presentations should be conveniently provided.

Adequate shop facilities and tools are needed for the programs because of the need for students to develop knowledge and skills in the areas of machinery maintenance and repair, building maintenance and construction, and basic wiring and plumbing. Tools should be kept in storage facilities in the shop areas where they can be secured.

Land that can be used for outdoor laboratories to demonstrate the effectiveness and safe use of pesticides, to grow demonstration plots of grasses and certain crops, and to develop skills in other areas of production agriculture is necessary for institutions offering Agricultural Science and Mechanization and Agricultural Science. Practical experiences are essential to students so that they will be competent to perform the skills required when they begin employment.

A storage facility is needed to house tractors and other equipment and specialized tools needed for these programs. This facility should have a large pull-down type door to allow equipment to be driven inside. It is necessary to secure the building at all times to reduce the risk of theft.

### Equipment

If these programs are to be effective, the institution must own, lease, or have access to tractors, cultivators, planting and harvesting equipment, welders, etc. Students must become knowledgeable about the use, maintenance, and repair of the equipment used in farming operations. Instructors must keep a current inventory of equipment and immediately report any stolen or missing items. Also, as new equipment is developed, efforts should be made to acquaint students with the new equipment and purchases should be made when justified.

### Textbooks, References, and Visual Aids

Appropriate textbooks, references, and visual aids are very important for teaching any subject area to insure that current information is presented and that materials are selected that best meet the particular needs of the student. Textbooks, references, and visual aids must be reviewed constantly and updated or supplemented based on new knowledge in the field and the results of research in teaching methods and developing concepts. Whatever teaching materials are used, instructors should select materials that meet course objectives. Materials should always be carefully previewed and studied by instructors before they are used.

## The Library

The library is an important source of reference materials for students to use in obtaining additional information on particular subjects assigned by instructors or for students to investigate interest areas on their own. The library should contain up-to-date books, periodicals, and other reference materials related to production agriculture areas. Agricultural Science and Mechanization and Agricultural Science instructors and students should be involved in selecting materials for the library and/or approving reference materials for production agriculture courses.

Characteristics of a quality library include qualifications of the librarian and library assistants; the facilities; the number and type of periodicals, books, and other reference materials; and the staffing and organizational structure. Library facilities should be readily accessible to both full-time and part-time students and faculty not only during instructional hours but during other hours convenient to both students and faculty.

Instructors should plan their instructional process to include students using the library to develop the habit of using it as a learning tool and to help foster a professional attitude which regards libraries as a resource for research endeavors and as good sources of information.

## Professional Boards and Associations

It is important that Agricultural Science and Mechanization and Agricultural Science instructors and students be aware of professional boards and associations in the field of production agriculture. Instructors should work closely with these boards and associations because they can offer many benefits to their program. Some of the benefits include books, references, and other publications; new concepts, processes, techniques, and equipment available in the production agriculture field; provide support in investigating the need for a program, in promoting the program, in providing work experience for students, and in placement of graduates; supply resource people to speak to classes; and to host student groups on field trips or for individual student projects.

Early in their studies, students should become aware of the various boards and associations and the services and resources they offer. By becoming acquainted with them and by becoming active or ad hoc members if possible, students can learn quickly of developments in the production agriculture industry and become acquainted with persons in the community, region, and state who are active in the field.

# CHAPTER II

## COMPETENCY-BASED CURRICULUM DEVELOPMENT PROJECT

The primary objective of vocational/technical education programs is to prepare individuals for employment in the occupations for which the programs are designed and developed. This education should be consistent with the ability, desire, and needs of the student; maintaining quality standards that are consistent with employment requirements.

Since the development of the Community College System, continuous concern and effort have been given to insuring the quality of programs, providing program guidelines, evaluating programs, improving the articulation process, and working with students, employers, and educators to determine student, business, industry, government, and service needs.

To further the development of quality vocational programs and articulation efforts between programs in the secondary schools and the community colleges, technical colleges, and technical institutes, the North Carolina Advisory Council on Vocational Education in its 1975 Annual Report recommended the following:

> That the State Board of Education require that all vocational curricula designed to produce job entry skills be based on performance objectives validated by recent job analysis and task analysis and that parallel performance standards be established for completion of secondary and postsecondary programs, and that the State Board of Education immediately consider the most efficient, expedient method for attaining such a goal.

To begin implementation of the Advisory Council's recommendation and to continue and improve the development of quality vocational and technical curriculums, the Occupational Program Services Staff of the Department of Community Colleges in 1976 designed a competency-based curriculum project to develop competencies for the vocational and technical curriculums offered in the System. The project was developed to help alleviate the following continuing concerns about vocational/technical education.

1. A quality of instruction which makes it possible for individuals completing a curriculum or phase of a curriculum to be prepared for employment;

2. Articulation between secondary and postsecondary vocational/technical curriculums;

3. Involvement of employers, employees, and educators in curriculum development;

4. Assurance that curriculums are up to date in accordance with current job technology requirements.

## Purpose of Project

The purposes of the project are: (1) to describe the desired outcomes of occupational programs, (2) to provide guidance for increased consistency among programs, and (3) to provide mechanisms for improved articulation with secondary and postsecondary occupational programs.

In response to the concerns regarding vocational/technical education, the project is designed to provide: (1) a validated list of career opportunities for which each curriculum provides training and education; (2) the tasks performed by employees in each job; (3) a list of competencies and evaluative criteria essential to successfully perform in the job; (4) curriculum guidelines; and (5) curriculum materials based on the competencies.

Specifically, the project:

1. Identifies each curriculum to be analyzed.
2. Identifies resources for curriculum development.
3. Identifies career opportunities for each curriculum.
4. Identifies tasks performed in the job.
5. Identifies competency and level of competency for each task.
6. Provides evaluative criteria for each competency.
7. Provides information for development and/or revision of curriculum guidelines and materials for career mobility at the secondary and postsecondary levels of instruction.

## Methodology

The procedure used in conducting the competency-based project for the Agricultural Science and Mechanization and Agricultural Science curriculums included: (1) organization of a working and curriculum committee; (2) initiating a resource search; (3) determining career opportunities available and validation of these careers; (4) listing and validating tasks; (5) writing competency statements and criterion measures for the tasks; and (6) developing a suggested curriculum and limited curriculum materials. The results of the project are presented in this manual.

## Organization of Committees

Each phase of this project is designed to assure maximum involvement of instructors, employers, and employees. In order to assure involvement, the procedural plan for the development of the competency-based project called for the development of two committees to assist in developing each curriculum--a working committee and a curriculum committee.

The working committee was made up of Agricultural Science and Mechanization and Agricultural Science instructors. The Presidents of various institutions that offer these two programs were written a letter explaining the project and they were asked if they would like their Agricultural Science and Mechanization and/or their Agricultural Science instructor(s) to serve on the committee. From the responses that were positive, the working committee was formed.

The working committee was responsible for assisting in the analysis, development, and validation of the total project. Specific duties of the working committee members were to assist in identifying, listing, and validating career opportunities and tasks, writing competencies and criterion measures for the tasks, and in developing limited curriculum materials. The members of the working committee are listed in Appendix A.

The curriculum committee for this project was the members of the working committee plus the farm owners, managers, and workers who responded to the job opportunities survey and task listing. Many of the curriculum committee members were enrolled in the Agricultural Science and Mechanization program in the various institutions.

## Resource Search

A resource search was conducted to locate competency-based curriculum materials in the areas of production agriculture. The search included sources such as ERIC, Abstracts of Instructional Materials in Vocational and Technical Education (AIM), Abstracts of Research and Related Materials in Vocational and Technical Education (ARM), Current Indexes to Journals in Education (CIJE), and Research in Education (RIE). Some of these sources provided good materials on tasks required of individuals employed in particular jobs.

## Career Opportunity Survey

Curriculum guides and manuals used in the Community College System identify career opportunities available in the various curriculum programs. These publications as well as others were reviewed to determine the careers available to students enrolled in Agricultural Science and Mechanization and Agricultural Science programs. These identified careers were then compared with job titles contained in the publications Dictionary of Occupational Titles, Vocational Education and Occupations, and Occupational Outlook Handbook.

The career opportunities identified were listed and then validated by a survey of farm owners, managers, and workers in North Carolina. One Agricultural Science and Mechanization and Agricultural Science instructor in each of the various institutions offering the programs were given ten career opportunity survey forms. The instructors were asked to identify several farm owners, managers, and workers to respond to the survey. A total of 250 career opportunity forms were provided and 175 of them were returned for a 75% response. A copy of the career opportunity survey form and a summary of the validation data is included in Appendices B-1, B-2, and B-3.

## Task Listing and Validation

After the jobs were identified and validated, tasks were listed for the various jobs by the working committee using the resource materials. The tasks were then categorized under major subject topics. The tasks were validated by mailing the task listing to the institutions offering Agricultural Science and Mechanization and Agricultural Science programs and asking the program instructors to distribute the listing to farm owners, managers, and workers. The instructors were also asked to complete the form. Of 300 task listings mailed, 177 were returned for a 59% response.

The task listing and task validation results are included in Appendices C-1, C-2, C-3, and C-4.

## Task Analyses

The working committee studied each task after validation and wrote competency statements and criterion measures for them. After these statements were written by the committee members, two consultants were hired to review and rewrite if necessary specified competencies and criterion measures. The competencies and criterion measures reviewed by the consultants were ones where no particular expertise existed among the instructors who were members of the working committee.

Competencies were written for each task to indicate specifically what the student is expected to be able to do. Evaluative criteria were written to indicate the desired performance level of students for each competency. The competencies and criterion measures are provided in Appendix D.

## Curriculum Materials

The curriculum materials in this manual include curriculum descriptions, a suggested schedule of courses by quarters, lecture, laboratory, clinical/shop, and quarter hours credit for each course, and course descriptions.

The suggested schedule of courses was determined from the task listing. Please note that the suggested courses are for a typical program in Agricultural Science and Mechanization. Programs at particular institutions across North Carolina may vary because of the nature of production agriculture in particular regions. Institutions must be aware of these differences and plan programs that meet the particular production agriculture needs for their area.

## CHAPTER III

## JOB DESCRIPTIONS/JOB COMPETENCIES

As indicated in the Methodology section in Chapter II, career opportunities for the Agricultural Science and Mechanization and Agricultural Science programs were identified by examining various publications and then validated by surveying farm owners, managers, and workers. A list of the validated entry level and advanced level jobs are given below.

Suggested job descriptions and job tasks have been identified for each career opportunity. This information can be used to assist instructors in describing the types of educational experiences recommended for students. It is recommended that job tasks be reviewed by curriculum advisory committees and used to assist the institution in meeting local manpower needs.

### Agricultural Science and Mechanization and Agricultural Science Career Opportunities

| Category | D.O.T. Number | Job Title |
|---|---|---|
| Entry Level | 180.167-050 | Crew Leader |
| | 624.381-014 | Farm Equipment Mechanic II |
| | 409.683-010 | Farm Machine Operator |
| | 421.683-010 | Farmworker |
| | 408.381-010 | Pest Control Worker |
| | 272.357-014 | Sales Representative, Agriculture Equipment and Supplies |
| | 620-684-030 | Tractor Mechanic Helper |
| Advanced Level | 410.161-018 | Dairy Farmer |
| | 624.281-010 | Farm Equipment Mechanic I |
| | 401.137-010 | Farm Supervisor |
| | 401.161-010 | Farmer, Cash Grain |
| | | Farmer, Contract |
| | 407.161-010 | Farmer, Diversified Crops |
| | 404.161-010 | Farmer, Field Crops |
| | 421.161-010 | Farmer, General |
| | 402.161-010 | Farmer, Vegetable |
| | 180.167-018 | General Manager, Farm |
| | 410.161-018 | Livestock Farmer |
| | 411.161-018 | Poultry Farmer |
| | 408.137-010 | Supervisor, Insect and Disease Inspection |
| | 410.161-018 | Swine Farmer |
| | 404.161-010 | Tobacco Grower |
| | 620.281-058 | Tractor Mechanic |
| | 403.161-010 | Tree Farmer |

## Crew Leader ENTRY LEVEL

### Job Description

Coordinates activities of group of farmworkers engaged in planting, cultivating, and harvesting diversified crops. Recruits members for group. Studies production schedules and estimates worker-hour requirements for completion of job assignment. Interprets company policies to workers and enforces safety regulations. Interprets specifications, blueprints, and job orders to workers, and assigns duties. Establishes or adjusts work procedures to meet production schedules, using knowledge of capacities of machines and equipment. Recommends measures to improve production methods, equipment performance and quality of product, and suggests changes in working conditions and use of equipment to increase efficiency of shop, department, or work crew. Analyzes and resolves work problems, or assists workers in solving work problems. Initiates or suggests plans to motivate workers to achieve work goals. Recommends or initiates personnel actions, such as promotions, transfers, discharges, and disciplinary measures. May train new workers. Maintains time and production records. May estimate, requisition, and inspect materials. May confer with other supervisors to coordinate activities of individual departments. May confer with workers' representatives to resolve grievances. May set up machines and equipment. When supervising workers engaged chiefly in one occupation or craft, is required to be adept in the activities of the workers supervised. When supervising workers engaged in several occupations, is required to possess general knowledge of the activities involved.

### Tasks

The following tasks may be performed: (In addition to tasks performed by Farmworker)

1. File records, job sheets, service manuals, and other information.
2. Schedule appointments.
3. Write notes, memos, and business letters.
4. Use telephone to order and/or sell materials, parts, equipment, produce, etc.
5. Make bank deposits.
8. Write checks.
10. Maintain employee work records.
16. Record crop production information.
17. Record livestock production information.
18. Report and record accidents.
35. Interpret and follow OSHA regulations relating to farm enterprises.
44. Interpret and follow feed additive mixing regulations.
45. Identify EPA regulations which apply to all farming enterprises--dairy, beef, swine, crop, poultry, vegetables, forage, etc.
48. Interpret and follow feed additive withdrawal laws and regulations.
49. Identify shipping regulations for animals and crops.

57. Interpret milk production standards.
116. Plan work schedules.
117. Establish priorities on work to be completed.
118. Identify peak labor periods.
119. Determine amount of labor needed.
120. Hire and fire workers and perform disciplinary action.
121. Train workers to perform tasks.
122. Evaluate workers' performance.
123. Assign specific responsibilities to workers.
125. Identify labor available.
126. Evaluate influence labor utilization has on farm income.
127. Identify ways to reduce inefficient use of labor.
128. Determine whether to hire more labor or hire custom services.
130. Determine amount to order.
131. Determine what to order.
132. Determine when to order.
133. Compare costs and quality of products from various sources.
134. Determine amount of supplies to keep on hand.
135. Identify sources of supplies.
136. Evaluate future supply needs.
197. Identify building repairs needed.
215. Identify equipment repairs needed.
374. Select materials to control internal and external parasites.
387. Worm animals.
388. Vaccinate animals.
391. Give intramuscular injections.
480. Prepare forms to submit with samples.
481. Interpret test results and recommendations.
558. Determine dates for harvesting.
559. Determine stage of maturity.
560. Evaluate influence stage of maturity has on quality and value.
561. Take moisture checks.
562. Take yield checks.
563. Determine field harvesting losses.

## Farm Equipment Mechanic II

### Job Description

Services, adjusts, and makes minor repairs on farm vehicles, machinery, and equipment, such as tractors, trucks, automobiles, harvesters, combines, silo fillers, plows, and similar equipment, using handtools. Observes and examines machinery and parts in operation to detect malfunctioning or defective units. Replaces components, such as carburetors, fuel pumps, generators, ignition points, and spark plugs. Adjusts timing of motors, lubricates, washes, paints, and cleans vehicles and attachments, using handtools. May assist other workers in more complex maintenance tasks, such as overhaul of machinery and equipment, repair and erection of buildings and structures, plumbing repair, and electrical work on farm.

## Tasks

The following tasks may be performed:

19. Follow safe work habits.
23. Determine appropriate clothing to wear.
28. Adjust safety devices.
29. Install safety devices.
40. Use hand and power tools safely.
41. Interpret equipment safety instructions in operator's manual.
42. Interpret equipment safety symbols.
58. Identify tools.
59. Adjust tools.
60. Clean tools.
61. Interpret tool operation instructions.
63. Select appropriate tools for specific jobs.
65. Store tools properly.
67. Properly use tools.
70. Add wheel and front-end weights.
71. Connect front-end operated equipment.
72. Connect hydraulic systems and hydraulic operated equipment.
73. Connect three-point hitch equipment.
74. Hitch towed equipment.
76. Refuel power units.
78. Use appropriate power equipment for specific purposes.
79. Make proper adjustment to equipment for most efficient operation.
81. Add coolant to cooling systems.
82. Add oil to equipment and vehicles.
83. Adjust carburetors.
84. Adjust clutch pedal free travel.
85. Bleed diesel fuel system.
86. Change oil and oil filters.
87. Change thermostats.
88. Clean debris from equipment.
89. Grease equipment.
90. Inflate tires.
91. Inspect cooling system for leaks.
92. Install and adjust belts.
93. Install and adjust chains.
94. Install and service battery.
95. Interpret maintenance directions in operator's manuals.
96. Repack bearings.
97. Replace and adjust spark plugs.
98. Replace bearings and seals.
99. Replace diesel fuel nozzles.
100. Replace spark plug wires.
101. Replace radiator hoses.
102. Replace universal joints.
103. Service air cleaners.
104. Service fuel strainer, fuel filters, and sediment bowl on fuel systems.
105. Time engines.

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106. Prepare equipment for storage.
107. Install carburetor repair kit.
279. Replace belts and pulleys.
281. Replace electrical switches.
282. Replace fuses.
658. Locate proper specifications for equipment.
660. Follow written repair procedures.
662. Determine potential causes of equipment failure.
663. Visually inspect for defects.
665. Follow troubleshooting procedures in service manuals.
666. Run dynamometer test.
669. Adjust mechanical brakes.
670. Adjust power brakes.
671. Bleed power brakes.
672. Inspect backing plate, brake disk, pressure plates, and brake pistons.
673. Replace brake lining.
674. Replace brake springs, pins, and/or balls.
675. Remove and install cylinders, shoes, and disk.
676. Test brakes after adjustment.
677. Adjust track tension.
678. Adjust wheel bearings.
679. Adjust wheel width.
680. Inflate tires.
681. Inspect bearings and seals.
682. Inspect track pins and bushings.
683. Load tires with liquid.
684. Patch tubes.
686. Repack wheel bearings.
687. Replace wheel bearings and seals.
688. Adjust steering gear bearings.
689. Adjust toe-in, drag link, and turning angle.
690. Bleed power steering system.
692. Inspect power steering system for leaks.
695. Install and adjust power steering pump belt tension.
696. Remove and install ball joints.
703. Add hydraulic oil to system.
704. Bleed hydraulic system or remove cylinders.
707. Drain, clean, flush, and refill hydraulic system.
712. Inspect and clean oil cooler.
726. Replace hydraulic oil filters.
728. Adjust regulator air gap.
729. Check for spark.
730. Check ignition resistor with ohmmeter.
731. Check specific gravity of battery.
732. Check timing.
733. Clean and inspect distributor cap, rotor, and housing cover.
734. Clean regulator contact points.
735. Clean starter drives.
736. Conduct generator output test for amperage, voltage, and resistance.
737. Conduct regulator current test.

738. Conduct regulator voltage test.
739. Determine purpose of parts in the system.
740. Identify parts of the system.
741. Inspect breaker points.
742. Inspect components of distributor.
743. Inspect components of starter.
744. Inspect for poor electrical connections.
745. Inspect parts of generator.
746. Inspect the wiring harness for broken wires.
747. Inspect spark plugs.
748. Inspect switches.
749. Install and adjust breaker points.
750. Install and adjust generator belts.
751. Install and adjust spark plug.
752. Install and service battery.
757. Remove and install distributor.
758. Remove and install generator.
759. Remove and install voltage regulator.
764. Replace spark plug wires.
765. Replace starter brushes.
785. Adjust headlights.
787. Repair broken electrical wires.
788. Replace circuit breakers.
789. Replace fuses.
790. Replace fuse blocks.
791. Replace gauges.
792. Replace lenses.
793. Replace light bulbs.
794. Replace speedometer cable and housing.
795. Replace switches.
796. Replace warning devices.
797. Test circuits for shorts, grounds, and open circuits.
798. Test operation of gauges.
799. Test solenoids.
876. Add oil to engines.
877. Change oil and oil filters.
878. Check and adjust oil pressure.
879. Clean diesel engine oil cooler.
885. Add coolant to system.
886. Back flush cooling system.
887. Clean cooling system with commercial cleaners.
888. Inspect and test system for leaks.
897. Replace radiator hoses.
898. Test thermostats.
919. Service air cleaner.

# Farm Machine Operator

## Job Description

Drives and operates one or more farm machines, such as tractors, trucks, and harvesters to perform specified farm activity as cutting hay and harvesting wheat. Hitches soil conditioning implement, such as plow or harrow to tractor and operates tractor and towed implement to furrow and grade soil. Drives tractor and operates designated towed machine, such as seed drill or manure spreader to plant, fertilize, dust, and spray crops. Prepares harvesting machine by adjusting speeds of cutters, blowers, and conveyors and height of cutting head or depth of digging blades according to type, height, weight, and condition of crop being harvested, and contour of terrain. Attaches towed- or mounted-type harvesting machine to tractor, using handtools, or drives self-propelled harvesting machine to cut, pull up, dig, thresh, clean, chop, bag, or bundle crops, such as sod, vine fruits, or livestock feed. Moves switches, pulls levers, and turns knobs and wheels to activate and regulate mechanisms. Refuels engine, lubricates machine parts, and monitors machine operations to ensure optimum performance. Drives truck to haul materials, supplies, or harvested crops to designated locations. May load and unload containers of materials and products on trucks, trailers, or rail cars by hand or driving forklift truck. May mix specified materials and dump solutions, powders, or seeds into planter or sprayer machinery. May oversee activities of field crews.

## Tasks

The following tasks may be performed:

9. Record equipment maintenance information
14. Record time and work performed on job sheets.
19. Follow safe work habits.
20. Identify potential safety hazards on equipment and around premises.
22. Use fire extinguishers properly.
23. Determine appropriate clothing to wear.
28. Adjust safety devices.
29. Install safety devices.
30. Determine when climatic conditions provide unsafe work situations.
31. Correct potential safety hazards.
32. Remove debris from work areas.
33. Use electrical connectors and safety devices.
34. Dispose of chemical containers properly.
36. Dispose of excess chemicals properly.
37. Clean up chemical spills.
38. Recognize symptoms of injury or poison.
39. Apply first aid to minor cuts, bruises, and burns.
40. Use hand and power tools safely.
41. Interpret equipment safety instructions in operator's manual.

42. Interpret equipment safety symbols.
43. Follow laws relating to chemical application and use.
46. Follow laws regarding application of chemicals near specific locations.
47. Follow government regulations regarding chemical tolerances and residue build up.
56. Interpret and follow regulations regarding operation of vehicles by minors.
58. Identify tools.
59. Adjust tools.
61. Interpret tool operation instructions.
63. Select appropriate tools for specific jobs.
66. Set up tools.
67. Properly use tools.
68. Interpret gauges.
69. Operate equipment and vehicles under working conditions.
70. Add wheel and front-end weights.
71. Connect front-end operated equipment.
72. Connect hydraulic systems and hydraulic operated equipment.
73. Connect three-point hitch equipment.
74. Hitch towed equipment.
75. Interpret hand operating signals.
76. Refuel power units.
77. Operate equipment and vehicles on public highways.
78. Use appropriate power equipment for specific purposes.
79. Make proper adjustment to equipment for most efficient operation.
80. Interpret operating instructions in operator's manual.
81. Add coolant to cooling systems.
82. Add oil to equipment and vehicles.
83. Adjust carburetors.
84. Adjust clutch pedal free travel.
85. Bleed diesel fuel system.
86. Change oil and oil filters.
88. Clean debris from equipment.
89. Grease equipment.
90. Inflate tires.
91. Inspect cooling system for leaks.
95. Interpret maintenance directions in operator's manuals.
876. Add oil to engines.
877. Change oil and oil filters.
878. Check and adjust oil pressure.
885. Add coolant to system.
897. Replace radiator hoses.

## Farmworker

### Job Description

Drives trucks and tractors and performs variety of animal and crop raising duties as directed on general farm. Plows, harrows, and fertilizes soil, and cultivates, sprays, and harvests crops, using variety of tractor-drawn machinery. Cares for livestock and poultry, observing general condition and administering simple medications to animals and fowls. Hauls feed to livestock during grass shortage and winter months. Operates, repairs, and maintains farm implements and mechanical equipment, such as tractors, gang plows, ensilage cutters, hay balers, and milking machines. Repairs farm buildings, fences, and other structures. May irrigate crops. May haul livestock and products to market. Usually works year-round and may oversee casual and seasonal help during planting and harvesting.

### Tasks

The following tasks may be performed: (In addition to tasks performed by Farm Machine Operator)

21. Store chemicals properly.
24. Ventilate work areas.
27. Store inflammable materials properly.
60. Clean tools.
62. Recondition broken hand tools.
64. Sharpen tools.
65. Store tools properly.
87. Change thermostats.
92. Install and adjust belts.
93. Install and adjust chains.
94. Install and service battery.
96. Repack bearings.
97. Replace and adjust spark plugs.
98. Replace bearings and seals.
99. Replace diesel fuel nozzles.
100. Replace spark plug wires.
101. Replace radiator hoses.
102. Replace universal joints.
103. Service air cleaners.
104. Service fuel strainer, fuel filters, and sediment bowl on fuel systems.
105. Time engines.
106. Prepare equipment for storage.
107. Install carburetor repair kit.
266. Apply wood and metal preservatives.
267. Clean and oil electric motors on structures.
268. Build and remove concrete forms.
269. Determine cost of repairs.

270. Develop bill of materials needed for repairs.
271. Repair and hang gates and doors.
272. Install electrical motors.
273. Lay blocks and brick.
274. Mix, pour, finish, and cure concrete.
275. Read and interpret blueprints.
276. Install and repair bracing in buildings and structures.
277. Repair electrical cords and broken wires.
278. Repair minor leaks in roof of buildings.
279. Replace belts and pulleys.
280. Reset circuit breakers.
281. Replace electrical switches.
282. Replace fuses.
283. Replace lighting fixtures.
284. Replace valves in water system.
285. Repair faucets.
286. Replace water pipe.
287. Replace window panes.
288. Wire electrical circuits.
289. Construct and repair fences.
290. Install and repair wood siding and panels on buildings and structures.
291. Repair metal structures with arc or oxyacetylene welder.
292. Frame, sheath, and roof buildings.
293. Install plumbing.
316. Fill feed troughs, bunks, and self feeders.
317. Fill and clean waterers.
318. Prepare feed mixtures.
319. Flush animals.
320. Precondition animals for shipping.
322. Wean animals.
323. Precondition animals for feedlot.
325. Identify moldy or spoiled feedstuffs.
326. Prepare milk replacer solution for calves.
327. Determine when calves may be started on grain and roughages.
328. Lead feed producing cows.
329. Determine when cows may be turned out to pasture.
330. Replace salt and mineral blocks.
331. Dry off cows.
332. Feed calves from buckets.
333. Assist animals in delivering young.
334. Castrate animals.
335. Check animals' milk supply.
336. Clean newborn animals.
337. Determine space needed for animals.
338. Disinfect and clip naval cord.
340. Exercise animals.
341. Help young to nurse.
342. Identify signs of approaching birth.
343. Identify due dates for animals.
344. Isolate newly purchased animals for observation.
345. Mark animals for identification.

346. Move brood sows to farrowing quarters.
347. Move pigs to smaller litters.
348. Pen animals according to size, weight, and sex.
349. Remove afterbirth.
350. Trim feet and hoofs.
351. Weigh animals.
352. Clip needle teeth.
353. Cut tails on feeder pigs.
354. Give iron shots.
355. Check underlines on sows.
356. Detusk boars.
357. Regulate temperature and air flow in farrowing quarters.
358. Place pigs in brooder or use heat lamps.
359. Wash sows and gilts before moving to farrowing quarters.
360. Paint sow's underline with iron compound.
361. Ring animals.
362. Bed animals.
363. Dehorn animals.
364. Move cows to calving pens.
365. Move calves to nurse cows.
366. Restrain cows with ropes or hobbles.
367. Clip cattle.
368. Determine length of dry period.
369. Remove excess teats from heifers.
371. Identify common livestock internal and external parasites.
372. Identify sanitation problems which may affect herd health.
376. Disinfect buildings and equipment.
378. Use insecticide repellents in buildings.
379. Apply insecticides to control external parasites.
380. Identify symptoms of common diseases.
381. Identify symptoms of major parasites.
384. Supply medication through feed and water.
385. Isolate animals with transmissible diseases.
387. Worm animals.
388. Vaccinate animals.
390. Interpret labels on medication and insecticide containers.
391. Give intramuscular injections.
395. Apply medication to cuts and bruises.
396. Identify and isolate injured animals.
398. Inspect udders for mastitis and bruises, cuts and bumps.
403. Load animals.
404. Prepare carriers for hauling animals.
418. Sort animals according to size and weight.
420. Determine number of animals to load.
425. Read measuring stick on bulk tank.
453. Prevent waste runoff from feedlots and housing quarters.
454. Remove and properly dispose of dead animals.
455. Properly remove wastes from quarters and pens.
457. Dispose of wastes properly.
458. Adjust pulsator speed.
459. Attach milker.
460. Check for abnormal milk.
461. Determine when cow is finished milking.

463. Dip teat cups in sanitizing solution.
465. Evaluate influence pulsator speed has on milking of cow.
466. Prevent "climbing" of milkers.
467. Strip cows.
468. Wash and dry udders.
469. Adjust vacuum.
470. Check freon in coolers.
471. Clean pulsators.
472. Remove milkstone.
473. Replace inflations.
474. Replace rings on milker heads.
475. Replace teat cup liners.
476. Select proper cleaning agents.
477. Set automatic timers.
478. Take representative soil sample.
479. Prepare soil and plant tissues to be submitted to testing laboratory.
493. Interpret labels on fertilizer bags.
494. Apply fertilizers in liquid, gaseous, and dry forms.
495. Mix fertilizer solutions.
496. Interpret manufacturer's fertilization rate charts.
499. Calibrate fertilizer equipment.
501. Recognize signs of fertilizer injury.
503. Transfer fertilizers from nurse tank to applicator.
517. Mix chemicals properly.
518. Calibrate application equipment.
519. Select correct type and size nozzles and tips.
520. Apply chemicals in dust and liquid form.
521. Interpret chemical labels.
522. Destroy plant residues.
523. Identify factors that influence chemical effectiveness.
524. Recognize chemical injury to plants.
529. Inoculate seeds.
530. Prepare seedbed.
531. Calibrate planting equipment.
538. Transplant appropriate crops.
548. Prepare carriers for hauling.
556. Pack and prepackage vegetables.
557. Trim vegetables for market.
564. Cut stubble for straw.
565. Bale straw and forage crops.
566. Cut forages for green chop feeding.
567. Cut forages for silage.
570. Determine when hay is "field cured" and ready to bale.
571. Determine when vegetables should be harvested during the day.
573. Control temperature and humidity in storage areas.
574. Determine moisture content of stored crops.
580. Remove damaged crops from storage.
581. Use grain dryer and fans.
582. Use proper types of storage facilities.
583. Stack bales properly.
584. Fill silo.

585. Supply additives as silage is blown into silo.
586. Cure vegetables prior to storage.
588. Determine light intensity in storage areas.
589. Check physical condition to determine storability.
592. Treat land with soil fumigants to control pests and weeds.
593. Broadcast proper analysis and amount of fertilizer.
594. Seed the plant bed.
595. Dig drainage ditches.
596. Select and use proper bed cover.
597. Apply treatment for mold.
599. Weed the bed.
600. Irrigate the bed.
601. Spray bed for worms.
602. Treat land for nematodes and apply pre-emergent herbicides and fertilizers.
603. Select proper size transplants.
604. Transplant tobacco.
605. Apply top-dressing.
606. Cut tops from tobacco.
607. Remove suckers and spray to prevent further growth.
608. Cultivate tobacco.
618. Transport tobacco to curing barns.
619. String tobacco on sticks or place in bulk racks or boxes.
620. Hang sticks on tiers or place bulk containers properly in barn.
622. Prepare the tobacco for marketing.
624. Properly sheets tobacco.
625. Deliver tobacco to warehouse.
626. Has tobacco weighed in.
632. Fill benches and pots.
633. Fill soil bins.
634. Identify greenhouse soil materials.
635. Level soil surface.
636. Mark soil for planting.
637. Mix soil with appropriate plant growing materials.
638. Prepare compost.
639. Shred or screen soil.
640. Spread peat moss on top of soil mix.
641. Steam soil.
642. Sterilize mixed soils with chemicals and heat.
643. Alter spacing of plants.
644. Apply shading compound to glass.
645. Basin plants for watering.
646. Control air temperature.
647. Control humidity.
648. Control light quantity and quality.
652. Hang lath or saran cloth.
653. Interpret light meters.
654. Mist plants.
655. Set automatic water timers.
656. Water greenhouse plants.
657. Set automatic light timers.
669. Adjust mechanical brakes.

670. Adjust power brakes.
671. Bleed power brakes.
677. Adjust track tension.
678. Adjust wheel bearings.
679. Adjust wheel width.
680. Inflate tires.
681. Inspect bearings and seals.
682. Inspect track pins and bushings.
683. Load tires with liquid.
684. Patch tubes.
686. Repack wheel bearings.
703. Add hydraulic oil to system.
785. Adjust headlights.
787. Repair broken electrical wires.
788. Replace circuit breakers.
789. Replace fuses.
790. Replace fuse blocks.
792. Replace lenses.
793. Replace light bulbs.
897. Replace radiator hoses.
898. Test thermostats.
932. Maintain proper bedding.
933. Vaccinate chicks.
934. Debeak and sex chicks.
937. Provide appropriate temperature and ventilation.
938. Provide appropriate feeders and drinkers and properly maintain them.
941. Keep feed consumption and growth records.
942. Maintain proper bedding.
943. Dispose of diseased birds properly.
944. Properly water and feed flock.
946. Determine proper space requirements.
947. Segregate poultry into groups according to weight, age, and sex.
948. Attach identification bands to legs or wings.
949. Clip wings.
950. Maintain routine disease and parasite control.
953. Maintain proper bedding.
955. Provide appropriate temperature and ventilation.
957. Properly maintain feeders and drinkers.
958. Provide appropriate nests and maintain bedding in nests.
959. Gather and clean eggs.
960. Grade and candle eggs.
961. Record egg production.
962. Pack eggs for storage and shipment.
963. Cull hens.
965. Candle and select eggs for hatching.
966. Keep breeding and egg production records.
971. Select, weigh, and mix feed.
972. Provide proper storage for feed.
975. Wash and disinfect house and equipment.
976. Maintain dry litter.

977. Chemically treat litter.
978. Properly dispose of litter.
979. Have knowledge of environmental conditions causing health problems.
980. Identify disease symptoms.
981. Detect internal and external parasites.
983. Isolate infected poultry.
984. Put medication in drinking water.
985. Administer internal and external parasite treatment.

## Pest Control Worker

### Job Description

Locates and exterminates plant and tree pests and diseases. Searches fields, brush, trees, and warehouses to locate plant pests, such as witchweed, boll weevil, Japanese beetle, soybean cyst nematode, fire ant, gypsy moth, white-fringed beetles, and army worms. Mixes exterminating agents, such as herbicides, insecticides, and fungicides, according to type of infection or infestation to be treated. Applies exterminating agents, using spray equipment. Destroys clusters of gypsy-moth eggs by painting or spraying clusters with creosote. Collects samples of infected soil or plants for laboratory analysis. Marks invested area to determine effectiveness of treatment. May specialize in treatment of one type of infestation, such as gypsy moth or witchweed.

### Tasks

The following tasks may be performed:

19. Follow safe work habits.
20. Identify potential safety hazards on equipment and around premises.
21. Store chemicals properly.
23. Determine appropriate clothing to wear.
25. Interpret information on labels and signs.
28. Adjust safety devices.
29. Install safety devices.
30. Determine when climatic conditions provide unsafe work situations.
31. Correct potential safety hazards.
34. Dispose of chemical containers properly.
36. Dispose of excess chemicals properly.
37. Clean up chemical spills.
38. Recognize symptoms of injury or poison.
39. Apply first aid to minor cuts, bruises, and burns.
42. Interpret equipment safety symbols.
43. Follow laws relating to chemical application and use.
46. Follow laws regarding application of chemicals near specific locations.

47. Follow government regulations regarding chemical tolerances and residue build up.
504. Identify common diseases, insects, and weeds.
505. Identify damage caused by insects, diseases, and weeds.
507. Inspect fields to determine when weed, insect, and disease infestations require control.
508. Evaluate life cycle of weeds and insects to determine appropriate control measures.
509. Identify various means by which diseases, insects, and weeds are spread.
511. Distinguish between harmful and beneficial insects.
512. Calculate costs of controls.
513. Select appropriate chemicals to control various insects, diseases, and weeds.
514. Determine appropriate mechanical and cultural means to control insects, diseases, and weeds.
515. Determine amount of chemicals to apply.
516. Determine when to apply chemicals.
517. Mix chemicals properly.
518. Calibrate application equipment.
519. Select correct type and size nozzles and tips.
520. Apply chemicals in dust and liquid form.
521. Interpret chemical labels.
522. Destroy plant residues.
523. Identify factors that influence chemical effectiveness.
524. Recognize chemical injury to plants.
525. Interpret chemical compatability charts.
602. Treat land for nematodes and apply pre-emergent herbicides and fertilizers.

## Sales Representative, Agriculture Equipment and Supplies

### Job Description

Sells farm and garden machinery, equipment, and supplies, such as tractors, feed, fertilizer, seed, insecticide, and farm and garden implements. Sells products to business and industrial establishments or individual for manufacturer or distributor at sales office, store, showroom, or customer's place of business, utilizing knowledge of product sold. Compiles lists of prospective customers for use as sales leads, based on information from newspapers, business directories, and other sources. Travels throughout assigned territory to call on regular and prospective customers to solicit orders or talks with customers on sales floor or by phone. Displays or demonstrates product, using samples or catalog, and emphasizes salable features. Quotes prices and credit terms and prepares sales contracts for orders obtained. Estimates date of delivery to customer, based on knowledge of own firm's production and delivery schedules. Prepares reports of business transactions and keeps expense accounts.

## Tasks

The following tasks may be performed:

2. Schedule appointments.
3. Write notes, memos, and business letters.
4. Use telephone to order and/or sell materials, parts, equipment, produce, etc.
108. Take physical inventory.
109. Determine inventory on hand.
130. Determine amount to order.
131. Determine what to order.
132. Determine when to order.
133. Compare costs and quality of products from various sources.
135. Identify sources of supplies.
136. Evaluate future supply needs.

## Tractor Mechanic Helper

## Job Description

Assists tractor mechanic in repairing tractors and tractor components, using handtools. Installs jacks and hoists to raise equipment and lift dismantled assemblies. Disassembles and assembles tractor parts, using handtools. Cleans tools and parts with naphtha, gasoline, or other cleaning compounds. May wash and lubricate equipment.

## Tasks

Assists in performing the tasks of Farm Equipment Mechanic I, Farm Equipment Mechanic II, and Tractor Mechanic.

## Job Description

Breeds and raises dairy cattle. Selects and breeds animals according to knowledge of animals, genealogy, characteristics, and offspring desired. Selects pasture, range, and crop lands to graze animals and produce feed crops. Mixes feed and feed supplements according to dietary requirements of animals and availability of grazing land. Feeds, waters, lays out salt licks for, and grazes animals. Observes animals to detect signs of illness and injury, treats minor injuries and ailments, disinfects and vaccinates animals, and engages veterinarian to treat serious illnesses and injuries. Attends animals during and after birth of offspring. Castrates, docks, and dehorns animals. Brands, tattoos, notches ears, and attaches tags to identify animals. Operates farm machinery to plant, cultivate, and harvest feed crops. Cleans and fumigates barns, stalls, and pens and sterilizes milking machines and equipment. Cools milk to prevent spoilage. Maintains and repairs farm machinery, equipment, buildings, pens, and fences. Arranges for sale of animals and products. Maintains cost and operation records. May butcher animals and cure meat. May hire and supervise workers. May groom and exhibit animals at livestock shows.

## Tasks

The following tasks may be performed: (In addition to tasks performed by Farmworker and Crew Leader)

6. Balance bank statements.
7. Maintain accounts payable and receivable.
11. Record farm receipts.
12. Record farm expenses.
13. Maintain monthly summary of cash expenses and receipts.
15. Record inventory information.
50. Determine when to consult lawyers and specialists.
51. Evaluate the regulations of various government programs.
52. Follow legal procedures for purchasing land.
53. Follow legal regulations regarding writing wills and inheritance.
54. Identify the property rights of owners.
55. Identify the rights and liabilities of tenants and landlords.
57. Interpret milk production standards.
108. Take physical inventory.
109. Determine inventory on hand.
110. Calculate depreciation.
111. Determine when to take inventory.
112. Determine salvage values of depreciable assets.
113. Establish values on assets, land, buildings, and equipment.
114. Identify resources to be inventoried.
115. Identify resources which are depreciable and non-depreciable.
124. Establish pay scale and benefits for workers.
129. Determine whether to do work yourself or hire it done.

137. Determine the amount of insurance needed.
138. Determine the kind and type of insurance needed.
139. Determine what to insure.
140. Determine when to insure.
141. Evaluate advantages and disadvantages of insurance plans.
142. Identify sources of insurance.
143. Determine the type of farm to be developed.
144. Determine the size of farm to be developed.
145. Determine whether to have joint ownership.
146. Determine whether to incorporate.
147. Determine whether to participate in government programs.
148. Determine whether to specialize or diversify.
149. Develop overall farm plan.
150. Establish farm family goals.
151. Establish priorities for utilization of resources.
152. Identify improvements to be made.
153. Calculate crop production efficiency factors.
154. Calculate family labor and management income.
155. Calculate investment credit.
156. Calculate labor efficiency factors.
157. Calculate machinery use efficiency factors.
158. Calculate management income.
159. Calculate net farm equity.
160. Calculate net farm profit.
161. Calculate net return to capital.
162. Calculate rate of capital turnover.
163. Calculate rate of return to capital.
164. Calculate operating margin.
165. Calculate percent of gross income absorbed by overhead.
166. Close and summarize the cash book at end of year.
167. Complete tax forms.
168. Decide whether to pay taxes on cash or accrual basis.
169. Determine amount of social security to be paid.
170. Determine amount of taxes to be paid.
171. Determine capital gains or losses.
172. Determine the personal and farm share of expenses.
173. Estimate income tax.
174. Identify strengths and weaknesses of farm business.
175. Calculate expected returns and profits on sales.
176. Determine feasibility of participating in futures market.
177. Select markets.
178. Interpret market reports.
179. Analyze market cycles.
180. Select appropriate marketing system.
181. Determine influence middlemen have on farmer's prices.
182. Determine if products should be held over for another year's income.
183. Determine when to market.
184. Develop marketing plan.
185. Determine influence substitutes have on agricultural products.
186. Determine when products are ready for market.
187. Determine influence supply and demand has on prices.

188. Calculate construction, remodeling, and repair costs.
189. Determine returns expected from building investments.
190. Determine size of buildings and structures needed.
191. Determine whether permanent or temporary structures should be constructed.
192. Determine whether single purpose or multiple purpose buildings are needed.
193. Determine whether to remodel or replace current buildings and structures.
194. Determine where to locate buildings and structures.
195. Estimate future building and structure needs.
196. Evaluate advantages and disadvantages of specific kinds and types of buildings and structures.
198. Select type of building materials to be used.
199. Work with others in designing and planning buildings and structures.
200. Select mechanical systems for use in buildings.
201. Calculate equipment operation costs.
202. Determine current conditions of machinery and equipment.
203. Determine size of machinery and equipment to purchase.
204. Determine what machinery and equipment is needed.
205. Determine whether to do custom work for others.
206. Determine whether to own machinery or lease it.
207. Determine whether to own equipment needed or hire custom work done.
208. Determine whether to repair equipment or hire work done.
209. Determine whether to repair or trade in equipment and machinery.
210. Determine whether to purchase new or used machinery and equipment.
211. Determine returns expected from equipment and machinery investments.
212. Develop regular equipment and machinery maintenance schedule.
213. Evaluate advantages and disadvantages of specific types and brands of equipment and machinery.
214. Evaluate possibility of joint ownership of equipment and machinery.
215. Identify equipment repairs needed.
216. Identify ways to reduce equipment and machinery costs.
217. Determine amount of feed to be purchased in addition to home-grown feeds.
218. Determine resources needed for livestock program.
219. Determine the amount of livestock for the farm.
220. Determine the grade of livestock for the farm.
221. Determine whether to expand or contract the livestock enterprises.
222. Develop livestock planning budgets.
223. Establish livestock enterprise production goals.
224. Identify resources available for the livestock enterprises.
225. Identify special production practices needed to attain production goals.
226. Identify ways to increase the efficiency of the livestock program.
227. Determine the type of livestock for the farm.
228. Develop livestock budgets.

241. Calculate amounts of interest owed on borrowed money.
242. Determine amount of credit needed.
243. Determine length of loan needed.
244. Develop budget to determine if it will pay to borrow money.
245. Develop debt repayment schedule.
246. Develop overall credit plan needed for farm.
247. Evaluate importance of good credit ratings.
248. Evaluate interest terms on loans.
249. Evaluate loan repayment terms and conditions.
250. Evaluate repayment capacity.
251. Identify and evaluate various sources of credit.
252. Identify factors which influence credit ratings.
253. Identify purposes for which credit is needed.
254. Identify the credit strengths and weaknesses of the farm business.
255. Determine amount of capital available for securing land.
256. Determine amount of land needed.
257. Determine if the land available fits the future farm plan.
258. Determine the type of farm and land needed.
259. Determine when to buy land.
260. Determine whether to buy, rent, or lease land.
261. Evaluate land price cycles.
262. Evaluate lease and rental agreements.
263. Identify available land.
264. Identify factors that will influence utilization of available land.
265. Make an appraisal of the land and buildings.
294. Develop rations for various ages and types of animals.
295. Calculate cost of rations and feed mixtures.
296. Calculate feed efficiency.
297. Classify feeds.
298. Determine amount of feed additives to add to mixtures.
299. Determine appropriate amount to feed per animal.
300. Determine appropriate form for preparing feed.
301. Determine nutrient level requirements for animals.
302. Determine relative nutritive value of feedstuffs.
303. Determine total amount of feed needed for herds.
304. Determine water requirements for animals.
305. Determine when feed additives should be withdrawn from animals.
306. Determine when rations and mixtures should be changed.
307. Evaluate how ration imbalance may affect production.
308. Identify factors that influence feed requirements and feed efficiency.
309. Determine purpose of various nutrients in rations and mixtures.
310. Interpret feed analysis reports.
311. Interpret feed tags and labels.
312. Interpret feeding charts and labels.
313. Select appropriate feeding methods.
314. Determine how feed palatability may be improved.
315. Determine amount of weight animals should gain.
321. Evaluate influence of using pasture on feeding requirements.
339. Evaluate influence of stress on growth and condition of animals.
370. Evaluate influence animal health has on production.

373. Identify symptoms of nutritional imbalance.
375. Work with veterinarians in developing herd health program.
377. Select proper chemicals to clean buildings and equipment.
382. Evaluate life cycles of parasites to determine control procedures.
383. Calculate cost of treatments.
386. Select appropriate method to control diseases.
389. Determine amount of medication or materials needed in specific situations.
390. Interpret labels on medication and insecticide containers.
392. Determine when to rotate pastures to control diseases and parasites.
393. Observe new animals for symptoms of diseases and parasites.
394. Determine when the veterinarian should be called.
397. Blood test cows.
399. Calculate expected returns and profits on sales.
405. Select markets.
406. Interpret market reports.
407. Analyze market cycles.
408. Select appropriate marketing system.
409. Select truckers.
410. Identify characteristics of USDA grades.
411. Determine affect middlemen and retailers have on producers' prices.
422. Determine base butterfat test.
423. Compare milk hauling expenses of companies.
424. Compare company base milk prices and differential prices for butterfat differences.
427. Determine age of animals.
428. Establish production goals for culling purposes.
429. Evaluate advantages of various breeds.
430. Evaluate general condition of animals.
431. Evaluate influence of consumers' demands on types of animal to select.
432. Evaluate overall performance and health records of animals.
433. Evaluate the degree various traits and characteristics are inherited.
435. Identify parts of animals.
436. Identify reputable sources for obtaining stock.
437. Inspect animals for defects.
438. Inspect animals for desirable traits and characteristics.
439. Select breeding system to follow.
440. Select feeder animals.
441. Select foundation stock.
443. Test boar for sterility.
444. Identify breeds.
445. Evaluate advantages of raising replacements vs. buying replacements.
446. Determine due date for animals.
447. Determine number of males needed for herd.
448. Determine when to breed.
449. Identify various causes of breeding difficulty.
450. Select breeding method.
451. Pregnancy test animals.

452. Identify factors affecting animal wastes decay.
456. Identify and select method of manure disposal.
457. Dispose of wastes properly.
462. Determine when milk is ready for shipping.
464. Establish and follow milking schedule.
540. Determine when to graze new forage seedings.

## Farm Equipment Mechanic I

### Job Description

Maintains, repairs, and overhauls farm machinery, equipment, and vehicles, such as tractors, harvesters, pumps, tilling equipment, trucks, and other mechanized, electrically powered, or motor-driven equipment, on farms or in farm-equipment repair shops. Examines and listens to machines, motors, gasoline and diesel engines, and equipment for operational defects and dismantles defective units, using handtools. Repairs or replaces defective parts, using handtools and machine tools, such as drill press, lathe, milling machine, woodworking machines, welding equipment, grinders, and saws. Reassembles, adjusts, and lubricates machines and equipment to insure efficient operation. May install and repair wiring and motors to maintain farm electrical system. May install and repair plumbing systems on farm. May construct and repair buildings and other farm structures. May assemble and erect new farm machinery and equipment.

### Tasks

The following tasks may be performed: (In addition to tasks performed by Farm Equipment Mechanic II)

68. Interpret gauges.
80. Interpret operating instructions in operator's manual.
659. Interpret sketches and diagrams.
661. Determine how breakages or defects in specific parts influence overall operation of equipment.
664. Recommend appropriate parts needed to correct equipment malfunctions.
667. Use oscilloscope and engine analyzer to test engine.
668. Use hydraulic system tester on hydraulic system.
685. Remove and install track.
691. Inspect power steering motor assembly.
693. Inspect power steering valve assembly.
694. Inspect steering gears.
697. Remove and install power steering motor.
698. Repair power steering valve assembly.
699. Remove and install power steering valve assembly.
700. Remove and install tie rods.
701. Repair power steering motor.
702. Replace steering gears and knuckles.

705. Determine purpose of hydraulic system parts.
706. Diagnose pump failures.
708. Evaluate influence contaminants have on operation of hydraulic system.
709. Identify parts of hydraulic systems.
710. Identify types of hydraulic pumps.
711. Identify types of hydraulic systems.
713. Inspect components of pumps and motors.
714. Inspect hydraulic valves and valve springs.
715. Install O-rings, seals, and packing.
727. Test valve cartridges for pressure setting.
753. Make no load test on starter.
754. Polarize the generator.
755. Read electrical schematic drawings.
756. Rebuild distributor or replace distributor parts.
760. Remove and install solenoid.
761. Remove and install starter.
762. Replace generator bearings.
763. Replace generator brushes and springs.
766. Replace starter bushing.
767. Take voltage drop tests.
768. Test coil polarity.
769. Test coil when cold and hot.
770. Test condensor for resistance, leakage, and capacity.
771. Test distributor with distributor tester.
772. Test generator armature for open circuit, ground, or short circuit in windings.
773. Test generator field coils for grounds or open circuits.
774. Test ignition system for open circuits, grounds, and resistance with voltmeter.
775. Test solenoid for resistance and voltage draw.
776. Test solenoid switch circuit.
777. Test starter armature and field coils.
778. Test for oxidized regulator points.
779. Time ignition system to engine.
780. Unlock starter.
781. Use voltmeter to check battery voltage.
782. Wire the ignition, charging, and starting circuits.
783. Replace field windings in starter.
784. Replace ignition switches.
786. Install wiring harness.
800. Adjust valve clearance.
801. Check compression.
802. Clean engine and engine parts.
803. Clean head.
804. Clean oil and water passages.
805. Deglaze cylinders.
806. Determine function of engine parts.
807. Grind valves.
808. Identify parts of engine.
809. Install head gasket.
810. Install valve guides.

811. Inspect and measure camshaft bushings.
812. Inspect and measure valve seats.
813. Inspect and replace gaskets.
814. Inspect and replace valve springs.
815. Inspect camshaft and measure camshaft tolerances.
816. Inspect camshaft gear.
817. Inspect components of rocker arm assembly for defects.
818. Inspect crankshaft and measure tolerances.
819. Inspect crankshaft gear.
820. Inspect cylinder and measure cylinder bore.
821. Inspect engine block.
822. Inspect flywheel.
823. Inspect head and head gasket.
824. Inspect main bearings and measure main bearing clearance.
825. Inspect connecting rods and measure rod bearing clearance.
826. Inspect pistons and measure piston tolerances.
827. Inspect piston pins and measure pin tolerances.
828. Inspect piston rings and measure piston ring tolerances.
829. Inspect ring gear.
830. Lap valves.
831. Measure camshaft end play.
832. Measure crankshaft end play.
833. Measure oil slinger run-out.
834. Measure valve guide tolerances.
835. Rebore cylinders.
836. Reface valve seats.
837. Remove and install camshaft.
838. Remove and install camshaft bushings.
839. Remove and install camshaft gear.
840. Remove and install crankshaft.
841. Remove and install crankshaft gear.
842. Remove and install cylinder liners.
843. Remove and install engine.
844. Remove and install front and rear oil seals.
845. Remove and install head.
846. Remove and install piston assembly.
847. Remove and install piston rings.
848. Remove and install piston pins.
849. Remove and install oil pan.
850. Remove and install valves.
851. Remove and install valve seat inserts.
852. Remove and install rocker arm assembly.
853. Remove and install rocker arm cover.
854. Remove and install timing chain.
855. Remove and install oil slinger.
856. Remove and install rod bearing inserts.
857. Remove cylinder ridge.
858. Remove or add shims.
859. Remove and replace main bearings.
860. Remove and replace flywheel.
861. Remove and replace ring gear.
862. Replace piston pin bushings.

863. Separate and rejoin tractor.
864. Torque rod bearing caps.
865. Torque main bearings.
866. Torque head bolts.
867. Time valve assembly.
868. Adjust for proper engine speed.
869. Inspect components of governor.
870. Inspect components of ventilator pump.
871. Measure idler gear end play.
872. Remove and install governor and/or ventilator pump.
873. Remove and install governor needle bearings.
874. Remove and install ventilator pump idler gear assembly.
875. Replace governor thrust bearings and weights.
880. Inspect components of oil pump.
881. Remove and install diesel engine oil cooler.
882. Remove and install oil pump.
883. Replace drive gear and shaft.
884. Replace idler gear.
889. Inspect components of water pump.
890. Install and adjust fan belt.
891. Remove and install fan.
892. Remove and install radiator.
893. Remove and install thermostats.
894. Remove and install water pump.
895. Replace water pump impeller.
896. Replace water pump seal and bearing.
899. Adjust carburetors.
900. Bleed fuel system.
901. Clean carburetor.
902. Clean sediment bowl and screen.
903. Determine purpose of various parts.
904. Identify parts of fuel system.
905. Inspect carburetor parts for defects.
906. Inspect manifolds.
907. Install carburetor repair kit.
908. Remove and install diesel fuel pump.
909. Remove and install fuel tank.
910. Remove and install gas fuel pump.
911. Remove and install manifolds.
912. Remove and install injection nozzles.
913. Repair injection nozzles.
914. Replace fuel filters.
915. Replace fuel lines.
916. Replace fuel system warning devices.
917. Replace needle bearings.
918. Run manifold vacuum test.
920. Test diesel fuel injection pump.
921. Test fuel pump.
922. Test injection nozzles.
923. Time injection pump.

## Farm Supervisor

### Job Description

Supervises and coordinates activities of workers engaged in one or more occupations. Studies production schedules and estimates worker-hour requirements for completion of job assignment. Interprets company policies to workers and enforces safety regulations. Interprets specifications, blueprints, and job orders to workers, and assigns duties. Establishes or adjusts work procedures to meet production schedules, using knowledge of capacities of machines and equipment. Recommends measures to improve production methods, equipment performance, and quality of product, and suggests changes in working conditions and use of equipment to increase efficiency of shop, department, or work crew. Analyzes and resolves work problems, or assists workers in solving work problems. Initiates or suggests plans to motivate workers to achieve work goals. Recommends or initiates personnel actions, such as promotions, transfers, discharges, and disciplinary measures. May train new workers. Maintains time and production records. May estimate, requisition, and inspect materials. May confer with other supervisors to coordinate activities of individual departments. May confer with workers' representatives to resolve grievances. May set up machines and equipment. When supervising workers engaged chiefly in one occupation or craft, is required to be adept in the activities of the workers supervised. When supervising workers engaged in several occupations, is required to possess general knowledge of the activities involved.

### Tasks

The tasks performed by a Farm Supervisor are the same as the tasks performed by a General Farm Manager.

## Farmer, Cash Grain

### Job Description

Plants, cultivates, and harvests one or more grain crops, such as barley, corn, soybeans, and wheat, for cash sale. Selects and buys type and amount of seed to be grown, taking into consideration local growing conditions and market demands. Operates equipment to plow, disk, harrow, and fertilize ground and to plant grain. Plans harvesting, considering ripeness and maturity of grain and weather conditions and operates grain-harvesting equipment. Sells grain or stores grain for future sale. Directs activities of workers. Hires and discharges workers.

### Tasks

The following tasks may be performed: (In addition to tasks performed by Farmworker, Crew Leader, Livestock Farmer, and Dairy Farmer except for the tasks specifically related to livestock and dairying)

229. Determine amount of crops to be grown.
230. Determine crop enterprises for the farm.
231. Determine crop rotations to be followed.
232. Determine whether to expand or contract crop enterprises.
233. Develop crop budgets.
234. Develop crop production schedule for farm.
235. Establish crop production goals.
236. Identify resources available for crop program.
237. Identify special production practices needed to attain production goals.
238. Identify ways to increase crop efficiency.
239. Identify resources needed for the crop program.
240. Plan field layout.
482. Use soil test results to plan fertility programs.
483. Calculate estimated costs of fertilizer and lime needed.
484. Determine amount of fertilizer and lime to apply.
485. Determine kind of fertilizer and lime to apply.
486. Determine when to apply fertilizer and lime.
487. Evaluate affect leaching and placement have on nutrient availability.
488. Evaluate influence soil pH has on nutrient availability.
489. Identify function of lime in crop production.
490. Identify function of major nutrients in crop production.
491. Identify nutrient deficiency symptoms in crop production.
492. Identify function of micro nutrients in crop production.
497. Determine the nutrient requirements of crops.
498. Select proper method to apply fertilizer.
500. Identify factors that influence effectiveness of fertilizers.
502. Identify factors that influence fertilizer requirements.
504. Identify common diseases, insects, and weeds.
505. Identify damage caused by insects, diseases, and weeds.
506. Evaluate influence of weeds, diseases, and insects on crop production.
507. Inspect fields to determine when weed, insect, and disease infestations require control.
508. Evaluate life cycle of weeds and insects to determine appropriate control measures.
509. Identify various means by which diseases, insects, and weeds are spread.
510. Identify disease and insect resistant varieties of plants.
511. Distinguish between harmful and beneficial insects.
512. Calculate costs of controls.
513. Select appropriate chemicals to control various insects, diseases, and weeds.
514. Determine appropriate mechanical and cultural means to control insects, diseases, and weeds.
515. Determine amount of chemicals to apply.
516. Determine when to apply chemicals.
525. Interpret chemical compatability charts.
526. Identify crops by seed and/or plants.
527. Identify advantages and disadvantages of various varieties.
528. Select varieties.
529. Inoculate seeds.

530. Prepare seedbed.
531. Calibrate planting equipment.
532. Determine seeding rate.
533. Determine when to plant.
534. Select proper seeding method(s).
535. Identify advantages and disadvantages of various planting methods.
536. Determine proper planting depth.
537. Identify problems related to seeding failure.
539. Interpret information on seed tags.
541. Select companion crops.
542. Calculate expected returns and profits on sales.
543. Classify crops for market purposes.
544. Determine feasibility of feeding or selling grains and forage.
545. Determine feasibility of participating in futures market.
546. Evaluate influence quality has on value.
547. Inspect for color, maturity, and foreign matter.
549. Select markets.
550. Interpret market reports.
551. Analyze market cycles.
552. Select appropriate marketing system.
553. Select appropriate methods of shipping.
554. Identify various grades.
555. Determine whether to hold grain for another year's income.
569. Determine number of cuttings to be harvested.
575. Determine safe moisture content for storing.
576. Estimate amount of crops in storage.
577. Estimate amount of storage space needed.
578. Evaluate influence moisture has on quality.
579. Identify storage problems that might occur.
587. Determine length vegetables may be stored.

## Farmer, Contract

### Job Description

A term applied to a farmer working on a contract basis for another farmer. Classifications are made according to kind of work contracted for as farm-machine operator, farmworker, etc.

### Tasks

The tasks performed for a Contract Farmer are the same as for the kind of work contracted such as Farm Equipment Mechanic, Farmworker, Farm Machine Operator, etc.

## Farmer, Diversified Crops

**Job Description**

Grows and harvests more than one kind of crop, such as fruit, grain, vegetable, and specialty crop, applying market condition and agricultural knowledge applicable to kinds of crops raised. Determine kinds and quantities of crops to grow according to market conditions, weather, and farm size and location. Selects and purchases supplies, such as seeds, fertilizers, and farm machinery, and arranges with buyers for sale of crops. Hires and directs activities of farm workers engaged in tilling soil and planting, cultivating, and harvesting crops. Performs various duties of farm workers, depending on farm size or season, including setting up and operating farm machinery, such as truck, tractor, disc harrow, and self-propelled harvester.

**Tasks**

The following tasks may be performed: (In addition to tasks performed by Farmworker, Crew Leader, Livestock Farmer, Dairy Farmer, and Cash Grain Farmer)

629. Determine appropriate soil mix for specific plants.
630. Determine soil texture.
631. Evaluate physical, chemical, and biological effects steam has on soil.
649. Determine appropriate temperatures for various plants.
650. Evaluate affect temperature has on plants.
651. Evaluate influence relative humidity has on plant growth.

## Farmer, Field Crops

**Job Description**

Plants, cultivates, and harvests specialty crops, such as alfalfa, cotton, hops, peanuts, sugarcane, and tobacco, applying knowledge of growth characteristics of individual crop, and soil, climate, and market conditions. Determines number and kind of employees to be hired, acreage to be tilled, and varieties and quantities of plants to be grown. Selects and purchases plant stock and farm machinery, implements, and supplies. Decides when and how to plant, cultivate, and irrigate plants and harvest crops, applying knowledge of plant culture. Attaches farm implements, such as plow, disc, and transplanter to tractor and drives tractor in fields to till soil and plant and cultivate crops. Drives and operates farm machinery to spray fertilizers, herbicides, and pesticides and haul harvested crops. Hires, assigns duties to, and oversees activities of farm workers. Demonstrates and explains farm work techniques and safety regulations to new workers. Maintains employee and

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financial records. Arranges with buyers for sale and shipment of crop. May install irrigation system(s) and irrigate fields. May set poles and string wires and twine on poles to form trellises. May lubricate, adjust, and make minor repairs on farm machinery, implements, and equipment, using mechanic's handtools and work aids. May plant seeds in coldframe bed and cover bed with cloth or glass to protect seedlings from weather. May transplant seedlings in rows, by hand or using transplanter machine. May grade and package crop for marketing.

### Tasks

The following tasks may be performed: (In addition to tasks performed by Farmworker, Crew Leader, Livestock Farmer, Dairy Farmer, Cash Grain Farmer, and Diversified Crops Farmer)

590. Select bed site.
591. Select profitable variety of tobacco.
592. Treat land with soil fumigants to control pests and weeds.
598. Identify and apply chemicals for plant bed diseases.
609. Determine most profitable method of harvesting.
610. Determine proper ripeness.
611. Determine most profitable method of curing.
612. Maintain yellowing heat in barn.
613. Increase heat to dry the leaf and stems.
614. Return moisture to prevent shattering.
615. Determine proper method of storage.
616. Maintain dry and pest-free storage facilities.
617. Use a wet-bulb thermometer to help regulate ventilation.
621. Determine best market and warehouse.
623. Determine optimum time to sell different grades.
627. Observe government graders.
628. Determine whether to accept the price or keep the tobacco and sell it at a later date.

## Farmer, General

### Job Description

Raises both crops and livestock. Determines kinds and amounts of crops to be grown and livestock to be bred, according to market conditions, weather, and size and location of farm. Selects and purchases seed, fertilizer, farm machinery, livestock, and feed, and assumes responsibility for sale of crop and livestock products. Hires and directs workers engaged in planting, cultivating, and harvesting crops, such as corn, peas, potatoes, strawberries, apples, peanuts, and tobacco, and to raise livestock, such as cattle, sheep, swine, horses, and poultry. Performs various duties of farm workers, depending on size and nature of farm, including setting up and operating farm machinery.

## Tasks

The tasks performed for a General Farmer are the same as the tasks performed for a Dairy Farmer, Livestock Farmer, Field Crops Farmer, Diversified Crops Farmer, Cash Grain Farmer, and Poultry Farmer.

## Farmer, Vegetable

### Job Description

Raises vegetables. Determines kind and amount of crop to be grown, according to market conditions, weather, and size and location of farm. Selects and purchases seed, fertilizer, and farm machinery and arranges with buyers for sale of crop. Hires and directs farm workers engaged in planting, cultivating, and harvesting crop, such as beans, onions, and peas. Performs various duties of farm workers, depending on size and nature of farm, including setting up and operating farm machinery. May grow vegetables in greenhouse to produce out-of-season crops. May grow a variety of vegetables and be designated as truck farmer. May specialize in growing a single vegetable and be designated by the name of the vegetable, as onion farmer.

### Tasks

The tasks performed for a Vegetable Farmer are the same as the tasks performed of a Cash Grain Farmer and a Diversified Crops Farmer.

## General Manager, Farm

### Job Description

Manages farm concerned with raising, harvesting, packing, and marketing farm products for corporations, cooperatives, and other owners. Analyzes market conditions to determine acreage allocations. Negotiates with bank officials to obtain credit from bank. Purchases farm machinery and equipment and supplies, such as tractors, seed, fertilizer, and chemicals. Hires and discharges personnel. Prepares financial and other management reports. Supervises office personnel engaged in preparing payrolls and keeping records. Visits orchards and fields to inspect and estimate maturity dates of crops. Confers with purchasers, and determines when and under what conditions to sell crops, marine life, or forest products. May be designated according to type of crop.

### Tasks

The tasks performed for a General Farm Manager are the same as the tasks performed of a General Farmer.

## Livestock Farmer

### Job Description

Breeds and raises livestock, such as beef, cattle, dairy cattle, sheep, and swine for such purposes as sale of meat, breeding, or for show, and for products, such as milk, wool, and meat. Selects and breeds animals according to knowledge of animals, genealogy, characteristics, and offspring desired. Selects pasture, range, and crop lands to graze animals and produce feed crops. Mixes feed and feed supplements according to dietary requirements of animals and availability of grazing land. Feeds, waters, lays out salt licks for, and grazes animals. Observes animals to detect signs of illness and injury, treats minor injuries and ailments, disinfects and vaccinates animals, and engages veterinarian to treat serious illnesses and injuries. Attends animals during and after birth of offspring. Castrates, docks, and dehorns animals. Brands, tattoos, notches ears, and attaches tag to identify animals. Operates farm machinery to plant, cultivate, and harvest feed crops. Cleans and fumigates barns, stalls, and pens, and sterilizes milking machines and equipment. Cools milk to prevent spoilage. Maintains and repairs farm machinery, equipment, buildings, pens, and fences. Arranges for sale of animals and products. Maintains cost and operation records. May butcher animals and cure meat. May hire and supervise workers. May groom and exhibit animals at livestock shows.

### Tasks

The following tasks may be performed: (In addition to tasks performed by Dairy Farmer, Cash Grain Farmer, Diversified Crops Farmer, Field Crops Farmer, and General Farmer)

324. Evaluate affect of various feeding practices on carcass composition and feed efficiency.
400. Classify animals for market purposes.
401. Determine feasibility of participating in futures market.
402. Evaluate influence of market grade on returns.
412. Determine whether animals should be held over for another year's income.
413. Determine most economical weights to market.
414. Calculate shrinkage.
415. Calculate dressing percent.
416. Estimate market grades.
417. Develop plan to spread marketing throughout year.
419. Determine when animals are ready to market.
421. Consign outstanding individuals at sales.
426. Calculate percentage and value of lean and prime cuts found in animals.
434. Identify major retail cuts of animals.
442. Take back fat probe.

## Poultry Farmer

### Job Description

Raises poultry to produce eggs and meat. Selects and purchases poultry stock. Feeds and waters poultry. Cleans and disinfects poultry houses, cages, and nests. Places vaccines in drinking water, injects vaccines into poultry, or dusts air with vaccine powder to vaccinate poultry against diseases. Inspects and disposes of or segregates infected poultry. Collects, inspects, and packs eggs and selects and crates pullets and fryers for shipment. Maintains growth, feed, and production records. Arranges with wholesalers for sale of poultry and eggs. May hire and supervise workers. May incubate fertile eggs.

### Tasks

The following tasks may be performed: (In addition to tasks performed by Dairy Farmer, Livestock Farmer, Cash Grain Farmer, Diversified Crops Farmer, Field Crops Farmer, and General Farmer)

924. Identify breeds.
925. Evaluate advantages and disadvantages of different breeds.
926. Determine factors for meat production.
927. Determine factors for egg production.
928. Determine brooder house space requirements.
929. Provide appropriate temperature and ventilation.
930. Determine feed and water requirements.
931. Determine amount of lighting needed.
935. Determine broiler house space requirements.
936. Determine amount of lighting needed.
939. Determine feed requirements for different weight and age of broilers.
945. Weigh and grade poultry for market.
946. Determine proper space requirements.
951. Provide proper lighting for sexual development and egg production.
952. Determine when pullets are mature for egg production.
954. Determine feed requirements.
956. Provide appropriate feeders and drinkers.
967. Evaluate different breeding programs.
968. Develop appropriate breeding program.
969. Determine end of breeding period.
970. Formulate rations.
973. Calculate feed conversion factors.
974. Recognize nutrient deficiencies.
982. Identify diseases.
985. Administer internal and external parasite treatment.
986. Properly store and use different antibiotics for different diseases.

## Supervisor, Insect and Disease Inspection

### Job Description

Supervises and coordinates activities of workers engaged in detecting presence of noxious insects and plant diseases in field crops and counting insect population applying knowledge of standard sampling techniques: Ascertains kinds of crops planted in each field and number of acreages involved to determine need for modifying sampling techniques and to determine number of workers needed. Assigns fields to workers, distributes sampling worksheets, and briefs new workers on identifying characteristics of prevalent insects and diseases. Compiles sampling-results data from worksheets to prepare composite insect and disease report for each field. Transports workers to and from fields using truck.

### Tasks

The tasks performed by an Insect and Disease Inspection Supervisor are the same as the tasks performed by a Crew Leader and Pest Control Worker.

## Swine Farmer

### Job Description

Breeds and raises swine. Selects and breeds animals according to knowledge of animals, genealogy, characteristics, and offspring desired. Selects pasture, range, and crop lands to graze animals and produce feed crops. Mixes feed and feed supplements according to dietary requirements of animals and availability of grazing land. Feeds, waters, lays out salt licks for, and grazes animals. Observes animals to detect signs of illness and injury, treats minor injuries and ailments, disinfects and vaccinates animals, and engages veterinarian to treat serious illnesses and injuries. Attends animals during and after birth of offspring. Brands, tattoos, notches ears, and attaches tags to identify animals. Operates farm machinery to plant, cultivate, and harvest feed crops. Cleans and fumigates barns, stalls, and pens. Maintains and repairs farm machinery, equipment, buildings, pens, and fences. Arranges for sale of animals and products. Maintains cost and operation records. May butcher animals and cure meat. May hire and supervise workers. May groom and exhibit animals at livestock shows.

### Tasks

The tasks performed by a Swine Farmer are the same as the tasks performed by a Livestock Farmer.

## Tobacco Grower

### Job Description

Plants, cultivates, and harvests tobacco, applying knowledge of growth characteristics of individual crop, and soil, climate, and market conditions. Determines number and kind of employees to be hired, acreage to be tilled, and varieties and quantities of plants to be grown. Selects and purchases plant stock and farm machinery, implements, and supplies. Decides when and how to plant, cultivate, and irrigate plants and harvest crops, applying knowledge of plant culture. Attaches farm implements, such as plow, disc, and transplanter to tractor and drives tractor in fields to till soil and plant and cultivate crops. Drives and operates farm machinery to spray fertilizers, herbicides, and pesticides and haul harvested crops. Hires, assigns duties to, and oversees activities of farm workers. Demonstrates and explains farm work techniques and safety regulations to new workers. Maintains employee and financial records. Arranges with buyers for sale and shipment of crop. May install irrigation system(s) and irrigate fields. May set poles and string wires and twine on poles to form trellises. May lubricate, adjust, and make minor repairs on farm machinery, implements, and equipment, using mechanic's handtools and work aids. May plant seeds in coldframe bed and cover bed with cloth or glass to protect seedlings from weather. May transplant seedlings in rows, by hand or using transplanter machine. May grade and package crop for marketing.

### Tasks

The tasks performed by a Tobacco Grower are the same as the tasks performed by Cash Grain Farmer, Diversified Crops Farmer, and Field Crops Farmer.

## Tractor Mechanic

### Job Description

Diagnoses mechanical failures of and repairs tractors and tractor components according to manuals, factory specifications, and knowledge of engine performances, using handtools, power tools, and testing instruments. Attaches compression, ignition, and timing test instruments to certain parts of tractor, using clamps and handtools. Starts engine dials and reads meters and gages of testing equipment to diagnose engine malfunction. Removes and disassembles engine, transmission, and clutches, using hoists, jacks, and mechanic's handtools. Inspects parts for damage, and verifies dimensions and clearances of parts for conformance to factory specifications, using gages, such as calipers, and micrometers. Replaces or repairs worn or damaged parts. Grinds valves, relines, and adjusts brakes, tightens body bolts, alines wheels, and tunes engine. May weld defective body of frame parts.

### Tasks

The tasks performed by a Tractor Mechanic are the same as the tasks performed by a Farm Equipment Mechanic II and a Farm Equipment Mechanic I.

## Tree Farmer

### Job Description

Plants and cultivates trees for pulpwood, lumber, and other timber products. Determines varieties and quantities of trees to be grown, acreage to be tilled, and employees to be hired. Selects and purchases tree stock and farm machines, implements, and supplies. Decides when and how to plant, bud, graft, cultivate, irrigate, and prune trees and harvest crop, based on knowledge of tree-crop culture. Attaches farm implements, such as plow, disc, and harrow, to tractor and drives tractor in fields to till soil. Plants root stock, applies fertilizers, insecticides, and fungicides, and irrigates fields. Prunes growing trees to develop desired size and shape. Assigns duties to farmhands and explains work techniques and safety regulations to inexperienced workers. Maintains employee and financial records. Arranges with buyers for sale of crops. Lubricates, adjusts, and makes minor repairs on farm machinery, implements, and equipment, using oilcan, grease gun, and handtools. May bud and graft stock. May plant ground crops to shade ground, conserve moisture, and improve soil.

### Tasks

The tasks performed by a Tree Farmer are the same as the tasks performed by a Diversified Crops Farmer.

# CHAPTER IV

# THE CURRICULUM

The curriculum guides contained in this chapter for the Agricultural Science and Mechanization and Agricultural Science curriculums contain the curriculum descriptions, suggested sequence of courses, and course descriptions. Individual institutions, with the assistance of curriculum advisory committees, should carefully study the suggested sequence of courses to determine if the courses meet the needs of the production agriculture industry. If one or more courses are not needed and other courses are needed, then the courses should be changed to meet the employment needs of the area to be served.

# AGRICULTURAL AND NATURAL RESOURCES EDUCATION

## AGRICULTURAL SCIENCE AND MECHANIZATION

## INTRODUCTION

### Purpose of Curriculum

This curriculum is designed primarily for persons involved in farming or agricultural related enterprises. The courses are planned to provide technical, scientific, and managerial concepts which supplement and relate to the experiences of students in their employment. The basic knowledge and skills of farming operations involving crops and livestock are included to insure a continuity of the theory and practical aspects of farming. Courses provide opportunities to gain knowledge and skills in crop and livestock production; managing the farm business; repairing, maintaining, and equipping the operation; laws and taxes, and long-range planning and forecasting.

### Employment Opportunities

The graduate of this program is trained to manage and operate a farm. In addition, the student should be able to perform most of the repairs to buildings and equipment, as well as perform the necessary electrical, construction, and plumbing requirements pertaining to the farm operation.

## AGRICULTURAL AND NATURAL RESOURCES EDUCATION

### AGRICULTURAL SCIENCE AND MECHANIZATION

### SUGGESTED CURRICULUM BY QUARTERS

| | Course Title | Hours Per Week | | | Quarter Hours Credit |
|---|---|---|---|---|---|
| | | Class | Lab. | Clin. | |
| **FIRST QUARTER** | | | | | |
| AGR 104 | Introduction to Agricultural Economics | 3 | 2 | 0 | 4 |
| AGR 170 | Plant Science | 3 | 2 | 0 | 4 |
| | | 6 | 4 | 0 | 8 |
| **SECOND QUARTER** | | | | | |
| AGR 119 | Techniques of Welding | 1 | 3 | 0 | 2 |
| AGR 185 | Soil Science and Fertilizers | 4 | 2 | 0 | 5 |
| | | 5 | 5 | 0 | 7 |
| **THIRD QUARTER** | | | | | |
| AGR 127 | Animal Nutrition | 3 | 2 | 0 | 4 |
| AGR 186 | Soils and Irrigation | 3 | 2 | 0 | 4 |
| | | 6 | 4 | 0 | 8 |
| **FOURTH QUARTER** | | | | | |
| AGR 205 | Agricultural Marketing | 2 | 2 | 0 | 3 |
| AGR 214 | Farm Machinery I | 2 | 4 | 0 | 4 |
| | | 4 | 6 | 0 | 7 |
| **FIFTH QUARTER** | | | | | |
| AGR 180 | General Poultry Science I | 2 | 2 | 0 | 3 |
| AGR 215 | Farm Machinery II | 2 | 4 | 0 | 4 |
| | | 4 | 6 | 0 | 7 |

|  |  | Hours Per Week |  |  | Quarter Hours Credit |
|---|---|---|---|---|---|
|  | Course Title | Class | Lab. | Clin. |  |
| SIXTH QUARTER |  |  |  |  |  |
| AGR 111 | Tractor Engines I | 2 | 4 | 0 | 4 |
| AGR 181 | General Poultry Science II | 2 | 2 | 0 | 3 |
|  |  | 4 | 6 | 0 | 7 |
| SEVENTH QUARTER |  |  |  |  |  |
| AGR 112 | Tractor Engines II | 2 | 4 | 0 | 4 |
| AGR 271 | Field Crops | 2 | 2 | 0 | 3 |
|  |  | 4 | 6 | 0 | 7 |
| EIGHTH QUARTER |  |  |  |  |  |
| AGR 115 | Tractor Hydraulic Systems | 2 | 3 | 0 | 3 |
| AGR 190 | Insect and Disease Control | 3 | 2 | 0 | 4 |
|  |  | 5 | 5 | 0 | 7 |
| NINTH QUARTER |  |  |  |  |  |
| AGR 201 | Agricultural Chemicals | 3 | 2 | 0 | 4 |
| AGR 213 | Farm Buildings and Structures I | 2 | 3 | 0 | 3 |
|  |  | 5 | 5 | 0 | 7 |
| TENTH QUARTER |  |  |  |  |  |
| AGR 217 | Tobacco Production | 3 | 2 | 0 | 4 |
| AGR 223 | Farm Buildings and Structures II | 2 | 3 | 0 | 3 |
|  |  | 5 | 5 | 0 | 7 |
| ELEVENTH QUARTER |  |  |  |  |  |
| AGR 204 | Farm Business Management | 3 | 2 | 0 | 4 |
| AGR 225 | Dairy Cattle Production | 2 | 3 | 0 | 3 |
|  |  | 5 | 5 | 0 | 7 |

| | | | Hours Per Week | | | Quarter Hours Credit |
|---|---|---|---|---|---|---|
| | | Course Title | Class | Lab. | Clin. | |
| **TWELFTH QUARTER** | | | | | | |
| AGR | 200 | Licensure | 2 | 0 | 0 | 2 |
| AGR | 210 | Tractor Systems | 2 | 4 | 0 | 4 |
| AGR | 296 | Agricultural Programs and Agencies | 2 | 0 | 0 | 2 |
| | | | 6 | 4 | 0 | 8 |
| **THIRTEENTH QUARTER** | | | | | | |
| AGR | 206 | Agricultural Finance | 3 | 2 | 0 | 4 |
| AGR | 226 | Swine Production | 2 | 3 | 0 | 3 |
| | | | 5 | 5 | 0 | 7 |
| **FOURTEENTH QUARTER** | | | | | | |
| AGR | 227 | Beef Production | 2 | 3 | 0 | 3 |
| AGR | 230 | Farm Records and Taxes | 3 | 2 | 0 | 4 |
| | | | 5 | 5 | 0 | 7 |
| **FIFTEENTH QUARTER** | | | | | | |
| AGR | 228 | Livestock Diseases and Parasites | 3 | 2 | 0 | 4 |
| AGR | 278 | Weed Identification and Control | 3 | 2 | 0 | 4 |
| | | | 6 | 4 | 0 | 8 |

Total Quarter Hours Credit 109

## AGRICULTURAL AND NATURAL RESOURCES EDUCATION

## AGRICULTURAL SCIENCE AND MECHANIZATION

### COURSE DESCRIPTIONS BY QUARTERS

### FIRST QUARTER

| | | Hours Per Week Class | Lab. | Clin. | Quarter Hours Credit |
|---|---|---|---|---|---|
| AGR 104 | Introduction to Agricultural Economics | 3 | 2 | 0 | 4 |

An introduction to the functions of the economic system and the economic principles underlying agricultural production and marketing. An analysis of the principles of decision making under changing conditions. An examination of the relationships between agriculture and other segments of the economy, and the factors in the economy that affect agriculture.

| | | | | | |
|---|---|---|---|---|---|
| AGR 170 | Plant Science | 3 | 2 | 0 | 4 |

An introductory general botany and crop science course covering the fundamental principles of the reproduction, growth, functions, and development of seed-bearing plants

### SECOND QUARTER

| | | | | | |
|---|---|---|---|---|---|
| AGR 119 | Techniques of Welding | 1 | 3 | 0 | 2 |

Principles of oxyacetylene and electrical arc welding, cutting, and brazing. Principles, procedures, safety precautions, and experience in using oxyacetylene and electrical arc equipment. Projects are assigned to develop skill in the use of equipment. Includes the study of metals, rods, gases, and special electric welding machinery.

| | | | | | |
|---|---|---|---|---|---|
| AGR 185 | Soil Science and Fertilizers | 4 | 2 | 0 | 5 |

A course dealing with the basic principles of efficient classification, evaluation, and management of soils; care, cultivation and fertilization of the soil, and conservation of soil fertility.

## THIRD QUARTER

AGR 127 Animal Nutrition 3 2 0 4

A course dealing with the principles of nutrition and their application to feeding practices of cattle, horse, sheep, and swine production.

AGR 186 Soils and Irrigation 3 2 0 4

A review of the fundamental soil science principles with emphasis upon those principles pertaining to the water relationships in the soil. A comprehensive study of irrigation systems-components, design, selection, operation, maintenance, repair, and sales.

## FOURTH QUARTER

AGR 205 Agricultural Marketing 2 2 0 3

An analysis of the functions of marketing in the economy and a survey of the problems marketing faces. A review of market structure and the relationship of local, terminal, wholesale, retail, and foreign markets. Problems in the operation of marketing firms including buying and selling, processing, standardization, and grading, risk taking and storage, financing efficiency, and cooperation. Discussion of procedures of marketing such commodities as grain, cotton, livestock, tobacco, apples, and small fruits and vegetables.

AGR 214 Farm Machinery I 2 4 0 4

A study of the operating principles of simple farm implements. The selection, field operation, maintenance, and repair of basic farm machinery such as plows, disks, harrows, and cultivators. Includes principles of design and mechanics, power supply, hitching, and economics of farm machinery use.

## FIFTH QUARTER

AGR 180 General Poultry Science I 2 2 0 3

An introduction to the science of poultry production. The major phases of the study include the history of the poultry industry; the anatomy and physiology of the chicken; the breeds and varieties; the breeding principles; and the principles of incubation, brooding, rearing, feeding, and housing.

AGR 215 Farm Machinery II 2 4 0 4

Care, repair, and selection of the larger units of farm equipment. Operating principles of self-propelled and tractor-drawn equipment will be studied in the classroom and in the field. Such equipment as balers, combines, corn pickers, cotton pickers, and peanut harvesters will be included.

## SIXTH QUARTER

AGR 111 Tractor Engines I 2 4 0 4

A study of tractor engine fundamentals, including gas and diesel engines. Major emphasis will be placed on types of engines, engine lubrication and lubricants, servicing and tune-up, combustion theory, cylinder and valve arrangements, fuel systems and horsepower calculations.

AGR 181 General Poultry Science II 2 2 0 3

This course is a continuation of the basic principles and practices of poultry science, including feeding principles and practices, poultry diseases, marketing of eggs and poultry, poultry farm management, and the production of turkeys, ducks, geese, and other poultry.

## SEVENTH QUARTER

AGR 112 Tractor Engines II 2 4 0 4

A continuation of the study of gas and diesel engines with specific emphasis on ignition, electrical, cooling, and transmission systems.

AGR 271 Field Crops 2 2 0 3

A general survey course dealing with the major field crops grown in North Carolina. Special emphasis will be given to tobacco, pastures and forage crops, and weeds and their control.

## EIGHTH QUARTER

AGR 115 Tractor Hydraulic Systems 2 3 0 3

The principles of hydraulics and their application to farm machinery. Components of tractor hydraulic systems, including maintenance of various systems.

AGR 190 Insect and Disease Control 3 2 0 4

A study of insects, their beneficial qualities and use, their harmful qualities and types, and the use of pesticides for control. Course also covers plant diseases and methods of disease control.

NINTH QUARTER

AGR 201 Agricultural Chemicals 3 2 0 4

A study of agricultural chemicals - their importance, ingredients, formulation, laws, and application with emphasis upon the effective and safe utilization of chemicals in agricultural pest control. Particular emphasis is placed upon weed identification and the chemicals utilized for weed control.

AGR 213 Farm Buildings and Structures I 2 3 0 3

This course deals with the fundamentals of farm carpentry, fences, concrete and masonry. The course also includes a study of farm water needs and waste disposal. Attention is given to planning farm water and plumbing systems and their proper care and maintenance.

TENTH QUARTER

AGR 217 Tobacco Production 3 2 0 4

This course discusses the production practices that are relevant to flue-cured and burley tobacco production in North Carolina. Emphasis will be placed on plant bed practices and field production - machinery, labor, cultural practices, fertilization, harvesting, and marketing.

AGR 223 Farm Buildings and Structures II 2 3 0 3

A study of the principles of construction, maintenance, and repair of farm buildings. Included also are the basic principles and systems of farm electrification for wiring buildings.

## ELEVENTH QUARTER

AGR 204 Farm Business Management 3 2 0 4

A review of the functions of the manager of a business firm and the problems he faces. Development of the concept of planning by both partial and complete budgeting. Review of the concepts of cost and the length of run in production. Practice in preparing enterprise budgets as an aid in choosing what to produce. Use of partial budgeting to fund the least cost production procedure. Analysis of production data to select the level of production that yields the most net revenue. Relationship between size, efficiency, and income of an orchard or farm. Review of procedures for evaluating the efficiency of the manager.

AGR 225 Dairy Cattle Production 2 3 0 3

An in-depth study of the principles of dairy production, including breeding and selection, health and sanitation, feed acquisition and utilization, and dairy farm buildings. Special emphasis is placed on the importance of herd and farm business records.

## TWELFTH QUARTER

AGR 200 Licensure 2 0 0 2

A detailed study of the rules and regulations dealing with the application of pesticides. Upon completion, the student will be prepared to sit for the Licensed Applicator examination of the State of North Carolina.

AGR 210 Tractor Systems 2 4 0 4

A comprehensive study of transmission, braking, and steering systems. Emphasis is placed on the maintenance and repair of these systems.

AGR 296 Agricultural Programs and Agencies 2 0 0 2

A review of the public agriculture programs and agencies that provide services for agricultural producers. The objectives, organization, functions, and service of these organizations are included.

## THIRTEENTH QUARTER

AGR 206 Agricultural Finance 3 2 0 4

Analysis of the capital structure of modern commercial agriculture with emphasis on the sources of credit. A review of lending institutions, repayment schedules, and credit instruments. Practice in the procedure of evaluating farm resources with attention to information needed for resource valuation, appraisal forms and procedures, discounting and depreciation.

AGR 226 Swine Production 2 3 0 3

A study of the development of swine producing and marketing industries. Also included are the principles and practices of selection, breeding, feeding, housing, marketing, and management of swine.

## FOURTEENTH QUARTER

AGR 227 Beef Production 2 3 0 3

A study of the principles and practices of beef cattle production, including breeding and selection, health and sanitation, and feed acquisition and utilization. Special emphasis is placed on the importance of herd and farm business records.

AGR 230 Farm Records and Taxes 3 2 0 4

An introductory study of accounting methods applicable to farm businesses. Terminology, basic principles, forms, and techniques used in recording and analyzing transactions are also covered. In addition, a study of taxes as related to farm income, forms, deductions, depreciation, and tax schedules applicable to farmers is included.

## FIFTEENTH QUARTER

AGR 228 Livestock Diseases and Parasites 3 2 0 4

A course dealing with the common diseases and parasites of livestock; sanitation practices and procedures with emphasis upon the cause, damage, symptoms, prevention, and treatment of parasites and diseases; management factors relating to disease and parasite prevention and control.

**AGR 278 Weed Identification and Control** 3 2 0 4

A study of the identification of major economically important annual and perennial weeds of North Carolina and the southeast with emphasis on the correctly recommended selective chemical control applied to crops of all types produced in North Carolina.

# AGRICULTURAL AND NATURAL RESOURCES EDUCATION

## AGRICULTURAL SCIENCE

## INTRODUCTION

### Purpose of Curriculum

The Agricultural Science curriculum is designed to prepare persons in the scientific, technical, and managerial concepts of farm and agricultural enterprise operations.

The program emphasizes the management and operation of farms. Courses are included to prepare the person to perform most of the repairs and installation of buildings and equipment, as well as perform electrical, construction and plumbing and irrigation requirements pertaining to the farm operation. Additional courses include those which prepare for planning, financing, marketing, and long-range forecasting of the farm enterprise.

### Employment Opportunities

The broad concepts taught in this curriculum prepare persons for jobs in farm and agriculture-related enterprises. Some of the jobs graduates are qualified for are Farm Machine Operator, Farmworker, Farm Equipment Mechanic, Farmer, Farm Manager or Supervisor, and Sales Representative, Agricultural Equipment and Supplies.

## AGRICULTURAL AND NATURAL RESOURCES EDUCATION

## AGRICULTURAL SCIENCE

### SUGGESTED CURRICULUM BY QUARTERS*

| | | Hours Per Week | | | Quarter Hours Credit |
|---|---|---|---|---|---|
| | Course Title | Class | Lab. | Clin. | |
| **FIRST QUARTER** | | | | | |
| AGR 104 | Introduction to Agricultural Economics | 3 | 2 | 0 | 4 |
| AGR 119 | Techniques of Welding | 1 | 3 | 0 | 2 |
| AGR 170 | Plant Science | 3 | 2 | 0 | 4 |
| AGR 127 | Animal Nutrition | 3 | 2 | 0 | 4 |
| ENG 101 | Grammar | 3 | 0 | 0 | 3 |
| | | 13 | 9 | 0 | 17 |
| **SECOND QUARTER** | | | | | |
| AGR 180 | General Poultry Science I | 2 | 2 | 0 | 3 |
| AGR 185 | Soil Science and Fertilizers | 4 | 2 | 0 | 5 |
| AGR 205 | Agricultural Marketing | 2 | 2 | 0 | 3 |
| AGR 214 | Farm Machinery I | 2 | 4 | 0 | 4 |
| ENG 102 | Composition | 3 | 0 | 0 | 3 |
| | | 13 | 10 | 0 | 18 |
| **THIRD QUARTER** | | | | | |
| AGR 181 | General Poultry Science II | 2 | 2 | 0 | 3 |
| AGR 186 | Soils and Irrigation | 3 | 2 | 0 | 4 |
| AGR 201 | Agricultural Chemicals | 3 | 2 | 0 | 4 |
| AGR 215 | Farm Machinery II | 2 | 4 | 0 | 4 |
| ENG 103 | Report Writing | 3 | 0 | 0 | 3 |
| | | 13 | 10 | 0 | 18 |

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|  |  | Course Title | Hours Per Week |  |  | Quarter Hours Credit |
|---|---|---|---|---|---|---|
|  |  |  | Class | Lab. | Clin. |  |
| FOURTH QUARTER |  |  |  |  |  |  |
| AGR | 111 | Tractor Engines I | 2 | 4 | 0 | 4 |
| AGR | 204 | Farm Business Management | 3 | 2 | 0 | 4 |
| AGR | 217 | Tobacco Production | 3 | 2 | 0 | 4 |
| AGR | 271 | Field Crops | 2 | 2 | 0 | 3 |
| ENG | 204 | Oral Communication | 3 | 0 | 0 | 3 |
|  |  |  | 13 | 10 | 0 | 18 |
| FIFTH QUARTER |  |  |  |  |  |  |
| AGR | 112 | Tractor Engines II | 2 | 4 | 0 | 4 |
| AGR | 190 | Insect and Disease Control | 3 | 2 | 0 | 4 |
| AGR | 200 | Licensure | 2 | 0 | 0 | 2 |
| AGR | 213 | Farm Buildings and Structures I | 2 | 3 | 0 | 3 |
| AGR | 225 | Dairy Cattle Production | 2 | 3 | 0 | 3 |
|  |  | Social Science Elective | 3 | 0 | 0 | 3 |
|  |  |  | 14 | 12 | 0 | 19 |
| SIXTH QUARTER |  |  |  |  |  |  |
| AGR | 115 | Tractor Hydraulic Systems | 2 | 3 | 0 | 3 |
| AGR | 206 | Agricultural Finance | 3 | 2 | 0 | 4 |
| AGR | 223 | Farm Buildings and Structures II | 2 | 3 | 0 | 3 |
| AGR | 226 | Swine Production | 2 | 3 | 0 | 3 |
| AGR | 296 | Agricultural Programs and Agencies | 2 | 0 | 0 | 2 |
|  |  | Social Science Elective | 3 | 0 | 0 | 3 |
|  |  |  | 14 | 11 | 0 | 18 |
| SEVENTH QUARTER |  |  |  |  |  |  |
| AGR | 210 | Tractor Systems | 2 | 4 | 0 | 4 |
| AGR | 227 | Beef Production | 2 | 3 | 0 | 3 |
| AGR | 228 | Livestock Diseases and Parasites | 3 | 2 | 0 | 4 |
| AGR | 230 | Farm Records and Taxes | 3 | 2 | 0 | 4 |
| AGR | 278 | Weed Identification and Control | 3 | 2 | 0 | 4 |
|  |  |  | 13 | 13 | 0 | 19 |
|  |  | Total Quarter Hours Credit |  |  |  | 127 |

* At the institution's discretion, students may enroll in the Agricultural Science curriculum and complete the sequence of courses or they may enroll in the Agricultural Science and Mechanization curriculum, complete the sequence of courses, and then transfer to the Agricultural Science curriculum and complete the minimum requirements of 18 hours of general education and receive the Associate in Applied Science Degree.

# AGRICULTURAL AND NATURAL RESOURCES EDUCATION

## AGRICULTURAL SCIENCE

## COURSE DESCRIPTIONS

The course descriptions for the agricultural courses in the Agricultural Science curriculum are the same as the course descriptions for the agricultural courses in the Agricultural Science and Mechanization curriculum.

The following course descriptions are for the suggested general education courses included in the Agricultural Science Curriculum.

| | Hours Per Week | | | Quarter Hours |
|---|---|---|---|---|
| | Class | Lab. | Clin. | Credit |
| ENG 101 Grammar | 3 | 0 | 0 | 3 |

Designed to aid the student in the improvement of self-expression through writing. Emphasis is on grammar, diction, sentence structure, punctuation, and spelling. It is intended to stimulate students in applying the basic principles of English grammar in their day-to-day situations in industry and social life.

| | | | | |
|---|---|---|---|---|
| ENG 102 Composition | 3 | 0 | 0 | 3 |

English composition is designed to aid the student in improvement of self-expression by means of practical application in business and technical writing. Emphasis is on writing sentences, paragraphs, and composition.

| | | | | |
|---|---|---|---|---|
| ENG 103 Report Writing | 3 | 0 | 0 | 3 |

The fundamentals of English are utilized as a background for the organization and techniques of report writing. Exercises in developing typical reports, using writing techniques and graphic devices are completed by the students. Practical application in the preparation of a full-length report is required of each student at the end of the term. The report must relate to the student's specific curriculum.

ENG 204 Oral Communication 3 0 0 3

The principles, techniques, and practical applications of communicating the thoughts and personality through the voice and visible action of the individual to one or more persons for the purpose of achieving a previously determined response. Areas covered vary according to class needs, but in general, include: basic concepts, nonverbal and verbal language, vocal usage, speech preparation (analyzing audience and occasion, determining purpose, selecting and narrowing subject, gathering and organizing material, wording and practicing aloud), and effective listening.

## Suggested Social Science Electives

SOC 101 Sociology 3 0 0 3

A study of basic sociology principles and of the basic process of group behavior. Includes the study of social interaction, family and group life, social institutions, status and role, culture, population, structure and change, and community structure, both urban and rural.

SOC 102 Principles of Sociology 5 0 0 5

An introductory course to the principles of sociology. An attempt to provide an understanding of culture, collective behavior, community life, social institutions and social change. Presents the scientific study of man's behavior in relation to other men, the general laws affecting the organization of such relationships and the effects of social life on human personality and behavior.

SOC 207 Rural Society 3 0 0 3

A study of selected elements of rural sociology with emphasis on current social changes. The course provides a sociological background for the understanding of rural social changes. Areas of study include rural culture, group relationships, social classes, rural and suburban communities, farm organizations, the communication of agricultural technology, rural social problems, agricultural adjustment and population change.

SOC 211 Marriage and Family 3 0 0 3

This course is designed to aid the student in understanding marriage and family living. The student will study marriage and family relationships and the role families play in the development of children.

### SSC 201 Social Science 3 0 0 3

An integrated course in the social sciences, drawing from the fields of anthropology, psychology, history, and sociology.

### SSC 202 Social Science 3 0 0 3

A further study of social sciences, with emphasis on economics, political science, and social problems as they relate to the individual.

### SSC 205 American Institutions 3 0 0 3

A study of the effect of American social, economic, and political institutions upon the individual as a citizen and as a worker. The course dwells upon current local, national, and global problems viewed in the light of our political and economic heritage.

### PSY 110 General Psychology 3 0 0 3

An introduction to the principles of human behavior. Includes a brief history of psychology as a science, basic psychological processes, personality and social behavior, contemporary knowledge of motives, intelligence, learning and emphasis on methods of communications and the understanding of self and others. The beginning concepts of approaches that are therapeutic in the people relationship are presented.

### PSY 206 Applied Psychology 3 0 0 3

A study of the principles of psychology that will be of assistance in the understanding of interpersonal relations on the job. Motivation, feelings, and emotions are considered with particular reference to on-the-job problems. Other topics investigated are: employee selection, supervision, job satisfaction, and industrial conflicts. Attention is also given to personal and group dynamics so that the student may learn to apply the principles of mental hygiene to his adjustment problems as a worker and a member of the general community.

# APPENDIX A

## AGRICULTURAL SCIENCE AND MECHANIZATION
## AGRICULTURAL SCIENCE

### Working Committee

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## APPENDIX B-1

## INTRODUCTORY CAREER OPPORTUNITY LETTER

## MEMORANDUM

TO: Coordinators, Agricultural Science and Mechanization and Agricultural Science Programs

FROM: Coy L. Hudson, Assistant Director, Special Programs

SUBJECT: Career Opportunity Survey

The Occupational Program Services Section, Department of Community Colleges, is conducting a project to determine the competencies required by employers in order for their employees to be successful on the job. This project is designed to: (1) develop a validated list of tasks performed by employees in a given job; (2) develop from the tasks, competencies which are required to perform successfully in the job; (3) develop curriculum guidelines; and (4) develop and/or revise curriculum materials based on the guidelines to assist educational personnel in providing quality occupational education programs.

One of the first tasks in this project is to determine the employment opportunities that are available to graduates of particular programs. For the Agricultural Science and Mechanization and Agricultural Science graduates, a number of production agriculture jobs are available. Some of these jobs have been identified from various sources. However, a validation of these and other farm-oriented jobs throughout the various regions of North Carolina is needed. Therefore, I would like for you to administer the ten forms that are enclosed to ten different farm owners, managers, or workers who are knowledgeable about farm employment opportunities in your region. You may want to use some members of your Agricultural Science and Mechanization and Agricultural Science Advisory Committee and/or members of your class.

After the selected individuals have completed the forms, please return them in the stamped, self-addressed envelope by ____________________. You might remind the participants that their responses will be compiled with the responses of other individuals completing the survey, with no individual responses identified.

Your participation in this project is greatly appreciated.

CLH/ljp

Enclosure

## APPENDIX B-2

## CAREER OPPORTUNITY SURVEY

### AGRICULTURAL SCIENCE AND MECHANIZATION
### AGRICULTURAL SCIENCE

The following employment opportunities have been identified as being possible careers open to individuals in production agriculture. These opportunities may or may not exist in your region of North Carolina.

Please indicate your opinion as to whether these employment opportunities do exist by checking (✓) the yes or no block next to the career identified. Please add additional opportunities in farming or production agriculture at the bottom of the list.

| D.O.T. CODE | CAREER OPPORTUNITY | YES | NO | COMMENTS |
|---|---|---|---|---|
| 409.683-010 | Farm Machine Operator | | | |
| 421.683-010 | Farmworker | | | |
| 180.167-050 | Crew Leader | | | |
| 624.281-010 | Farm Equipment Mechanic | | | |
| 404.161-010 | Tobacco Grower | | | |
| 410.161-018 | Swine Farmer | | | |
| 401.137-010 | Farm Supervisor | | | |
| 403.161-010 | Tree Farmer | | | |
| 272.357-014 | Sales Representative, Agricultural Equipment and Supplies | | | |
| 408.381-010 | Pest Control Worker | | | |
| 421.161-010 | Farmer, General | | | |
| 402.161-010 | Farmer, Vegetable | | | |
| 180.167.018 | General Manager, Farm | | | |
| 410.161-018 | Livestock Farmer | | | |
| 411.161-018 | Poultry Farmer | | | |

| D.O.T. CODE | CAREER OPPORTUNITY | YES | NO | COMMENTS |
|---|---|---|---|---|
| 620.684-030 | Tractor Mechanic Helper | | | |
| 620.281-058 | Tractor Mechanic | | | |
| 408.137-010 | Supervisor, Insect and Disease Inspection | | | |
| 410.161-018 | Dairy Farmer | | | |
| 401.161-010 | Farmer, Cash Grain | | | |
| | Farmer, Contract | | | |
| 407.161-010 | Farmer, Diversified Crops | | | |
| 404.161-010 | Farmer, Field Crops | | | |

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## APPENDIX B-3

## CAREER OPPORTUNITY SURVEY RESULTS

## AGRICULTURAL SCIENCE AND MECHANIZATION
## AGRICULTURAL SCIENCE

The following information was obtained from farm owners, managers, and workers identified by Agricultural Science and Mechanization and Agricultural Science instructors in the North Carolina Community College System. A total of 250 surveys were provided respondents and 175 were returned, or 75%. This information assists in validating the employment opportunities available in North Carolina in production agriculture.

| D.O.T. CODE | CAREER OPPORTUNITY | YES | NO | NO RESPONSE |
|---|---|---|---|---|
| 409.683-010 | Farm Machine Operator | 160 | 10 | 5 |
| 421.683-010 | Farmworker | 164 | 6 | 5 |
| 180.167-050 | Crew Leader | 140 | 20 | 15 |
| 624.281-010 | Farm Equipment Mechanic | 137 | 27 | 11 |
| 404.161-010 | Tobacco Grower | 145 | 17 | 13 |
| 410.161-018 | Swine Farmer | 150 | 14 | 11 |
| 401.137-010 | Farm Supervisor | 128 | 37 | 10 |
| 403.161-010 | Tree Farmer | 110 | 50 | 15 |
| 272.357-014 | Sales Representative, Agricultural Equipment and Supplies | 127 | 40 | 8 |
| 408.381-010 | Pest Control Worker | 130 | 35 | 10 |
| 421.161-010 | Farmer, General | 155 | 12 | 8 |
| 402.161-010 | Farmer, Vegetable | 116 | 45 | 14 |
| 180.167-018 | General Manager, Farm | 138 | 25 | 12 |
| 410.161-018 | Livestock Farmer | 133 | 30 | 12 |
| 411.161-018 | Poultry Farmer | 122 | 38 | 15 |

| D.O.T. CODE | CAREER OPPORTUNITY | YES | NO | NO RESPONSE |
|---|---|---|---|---|
| 620.684-030 | Tractor Mechanic Helper | 117 | 50 | 8 |
| 620.281-058 | Tractor Mechanic | 114 | 45 | 16 |
| 408.137-010 | Supervisor, Insect and Disease Inspection | 107 | 50 | 18 |
| 410.161-018 | Dairy Farmer | 126 | 40 | 9 |
| 401.161-010 | Farmer, Cash Grain | 134 | 30 | 11 |
|  | Farmer, Contract | 120 | 40 | 15 |
| 407.161-010 | Farmer, Diversified Crops | 141 | 24 | 10 |
| 404.161-010 | Farmer, Field Crops | 138 | 22 | 15 |

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## APPENDIX C-1

## TASK VALIDATION LETTER

## MEMORANDUM

TO: Coordinators, Agricultural Science and Mechanization and Agricultural Science Programs

FROM: Coy L. Hudson, Assistant Director, Special Programs

SUBJECT: Task Listing for Production Agriculture

As you are aware, I have been working on a competency-based project for the Agricultural Science and Mechanization and Agricultural Science programs. The first step in this project was to identify and validate the job opportunities that are available and may be held by graduates of these programs. Thank you for administering the Career Opportunity Survey to farm owners, managers, and workers that was used to validate the job listing.

The second step in this project is to identify and validate the tasks and levels of competency needed by individuals in order for them to perform satisfactorily in the various agriculture production occupations. Enclosed are 12 copies of task inventories and an introductory letter. Would you please assist with the validation of the task inventory by distributing eleven (11) of the inventories to farm owners, managers, and workers and completing the remaining form yourself. Instructions for completing the form are included on the form itself and other pertinent information is included on the introductory letter.

If you have any questions concerning the procedure or the form itself, please contact me.

Thank you very much for your continued support and assistance in this project.

CLH/ljp

Enclosure

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## APPENDIX C-2

## INTRODUCTORY TASK VALIDATION LETTER

## MEMORANDUM

TO: Farm Owners, Managers, and Workers

FROM: Coy L. Hudson, Assistant Director, Special Programs

SUBJECT: Task Listing for Production Agriculture

The Department of Community Colleges is conducting a project to evaluate and update the Agricultural Science and Mechanization and Agricultural Science programs in the system. The first step in this project was to identify appropriate positions or job opportunities that may be held by graduates of these two programs.

The second step in this project is to identify the tasks and levels of competency needed in order to perform satisfactorily in the various agriculture production occupations. Enclosed is an inventory of tasks that hopefully you will respond to in terms of which tasks are necessary and the level of competency of each task. Your opinion on this inventory will provide guidance for the development of quality agricultural production programs in the Community College System.

Please assist us with this project by completing the enclosed task inventory. Just follow the simple directions and return the inventory in the stamped self-addressed envelope by ____________________________. Your responses will be compiled with the responses of other individuals completing the inventory, with no individual responses identified.

Thank you very much for assisting in this project.

CLH/ljp

Enclosure

# APPENDIX C-3

## COMPETENCY-BASED AGRICULTURAL PRODUCTION CURRICULUM STUDY

## TASKS PERFORMED BY PERSONS EMPLOYED IN PRODUCTION AGRICULTURE

Directions: The following inventory is a list of tasks which may or may not be performed by persons employed in production agriculture. Please use the following key to make your evaluation of the level of competency of each task. The person should possess:

1. no competency in this activity
2. slight competency in this activity
3. moderate competency in this activity
4. considerable competency in this activity
5. complete competency in this activity

Please answer all questions. There are no right or wrong answers. What is important is how you rate each competency.

Please circle the rating (1-2-3-4-5) which best indicates your feelings as to the level of competency of each task. At times your exact feelings will not be represented, but select the answer nearest your feelings. Please do not omit any tasks. Also, at the end of the task listing, please add additional tasks which you feel individuals need in production agriculture occupations and rate each task you add.

Definition: Competent (Webster) 1. Well qualified; capable; fit.

Competency (Webster) 2. Condition or quality of being competent.

## COMPETENCY-BASED AGRICULTURAL PRODUCTION CURRICULUM STUDY

## TASKS PERFORMED BY PERSONS EMPLOYED IN PRODUCTION AGRICULTURE

no
slight
moderate
considerable
complete

TASKS

---

A. General Office Work

1. 1 2 3 4 5 File records, job sheets, service manuals, and other information.

2. 1 2 3 4 5 Schedule appointments.

3. 1 2 3 4 5 Write notes, memos, and business letters.

4. 1 2 3 4 5 Use telephone to order and/or sell materials, parts, equipment, produce, etc.

B. Recording Information

5. 1 2 3 4 5 Make bank deposits.

6. 1 2 3 4 5 Balance bank statements.

7. 1 2 3 4 5 Maintain accounts payable and receivable.

8. 1 2 3 4 5 Write checks.

9. 1 2 3 4 5 Record equipment maintenance information.

10. 1 2 3 4 5 Maintain employee work records.

11. 1 2 3 4 5 Record farm receipts.

12. 1 2 3 4 5 Record farm expenses.

| | no | slight | moderate | considerable | complete | TASKS |
|---|---|---|---|---|---|---|
| B. | | | | | | Recording Information (Continued) |
| 13. | 1 | 2 | 3 | 4 | 5 | Maintain monthly summary of cash expenses and receipts. |
| 14. | 1 | 2 | 3 | 4 | 5 | Record time and work performed on job sheets. |
| 15. | 1 | 2 | 3 | 4 | 5 | Record inventory information. |
| 16. | 1 | 2 | 3 | 4 | 5 | Record crop production information. |
| 17. | 1 | 2 | 3 | 4 | 5 | Record livestock production information. |
| 18. | 1 | 2 | 3 | 4 | 5 | Report and record accidents. |
| C. | | | | | | Safety Precautions |
| 19. | 1 | 2 | 3 | 4 | 5 | Follow safe work habits. |
| 20. | 1 | 2 | 3 | 4 | 5 | Identify potential safety hazards on equipment and around premises. |
| 21. | 1 | 2 | 3 | 4 | 5 | Store chemicals properly. |
| 22. | 1 | 2 | 3 | 4 | 5 | Use fire extinguishers properly. |
| 23. | 1 | 2 | 3 | 4 | 5 | Determine appropriate clothing to wear. |
| 24. | 1 | 2 | 3 | 4 | 5 | Ventilate work areas. |
| 25. | 1 | 2 | 3 | 4 | 5 | Interpret information on labels and signs. |
| 26. | 1 | 2 | 3 | 4 | 5 | Use proper lifting and carrying methods. |
| 27. | 1 | 2 | 3 | 4 | 5 | Store inflammable materials properly. |
| 28. | 1 | 2 | 3 | 4 | 5 | Adjust safety devices. |
| 29. | 1 | 2 | 3 | 4 | 5 | Install safety devices. |
| 30. | 1 | 2 | 3 | 4 | 5 | Determine when climatic conditions provide unsafe work situations. |
| 31. | 1 | 2 | 3 | 4 | 5 | Correct potential safety hazards. |

| | no | slight | moderate | considerable | complete | TASKS |
|---|---|---|---|---|---|---|
| **C.** | | | | | | **Safety Precautions (Continued)** |
| 32. | 1 | 2 | 3 | 4 | 5 | Remove debris from work areas. |
| 33. | 1 | 2 | 3 | 4 | 5 | Use electrical connectors and safety devices. |
| 34. | 1 | 2 | 3 | 4 | 5 | Dispose of chemical containers properly. |
| 35. | 1 | 2 | 3 | 4 | 5 | Interpret and follow OSHA regulations relating to farm enterprises. |
| 36. | 1 | 2 | 3 | 4 | 5 | Dispose of excess chemicals properly. |
| 37. | 1 | 2 | 3 | 4 | 5 | Clean up chemical spills. |
| 38. | 1 | 2 | 3 | 4 | 5 | Recognize symptoms of injury or poison. |
| 39. | 1 | 2 | 3 | 4 | 5 | Apply first aid to minor cuts, bruises, and burns. |
| 40. | 1 | 2 | 3 | 4 | 5 | Use hand and power tools safely. |
| 41. | 1 | 2 | 3 | 4 | 5 | Interpret equipment safety instructions in operator's manual. |
| 42. | 1 | 2 | 3 | 4 | 5 | Interpret equipment safety symbols. |
| **D.** | | | | | | **Legal Requirements and Regulations** |
| 43. | 1 | 2 | 3 | 4 | 5 | Follow laws relating to chemical application and use. |
| 44. | 1 | 2 | 3 | 4 | 5 | Interpret and follow feed additive mixing regulations. |
| 45. | 1 | 2 | 3 | 4 | 5 | Identify EPA regulations which apply to all farming enterprises--dairy, beef, swine, crop, poultry, vegetables, forage, etc. |
| 46. | 1 | 2 | 3 | 4 | 5 | Follow laws regarding application of chemicals near specific locations. |
| 47. | 1 | 2 | 3 | 4 | 5 | Follow government regulations regarding chemical tolerances and residue build up. |
| 48. | 1 | 2 | 3 | 4 | 5 | Interpret and follow feed additive withdrawal laws and regulations. |

no
slight
moderate
considerable
complete

TASKS

D. Legal Requirements and Regulations (Continued)

49. 1 2 3 4 5 Identify shipping regulations for animals and crops.

50. 1 2 3 4 5 Determine when to consult lawyers and specialists.

51. 1 2 3 4 5 Evaluate the regulations of various government programs.

52. 1 2 3 4 5 Follow legal procedures for purchasing land.

53. 1 2 3 4 5 Follow legal regulations regarding writing wills and inheritance.

54. 1 2 3 4 5 Identify the property rights of owners.

55. 1 2 3 4 5 Identify the rights and liabilities of tenants and landlords.

56. 1 2 3 4 5 Interpret and follow regulations regarding operation of vehicles by minors.

57. 1 2 3 4 5 Interpret milk production standards.

E. Using and Maintaining Hand and Power Tools

58. 1 2 3 4 5 Identify tools.

59. 1 2 3 4 5 Adjust tools.

60. 1 2 3 4 5 Clean tools.

61. 1 2 3 4 5 Interpret tool operation instructions.

62. 1 2 3 4 5 Recondition broken hand tools.

63. 1 2 3 4 5 Select appropriate tools for specific jobs.

64. 1 2 3 4 5 Sharpen tools.

65. 1 2 3 4 5 Store tools properly.

66. 1 2 3 4 5 Set up tools.

67. 1 2 3 4 5 Properly use tools.

| | no | slight | moderate | considerable | complete | TASKS |
|---|---|---|---|---|---|---|
| F. | | | | | | Operating Equipment and Vehicles |
| 68. | 1 | 2 | 3 | 4 | 5 | Interpret gauges. |
| 69. | 1 | 2 | 3 | 4 | 5 | Operate equipment and vehicles under working conditions. |
| 70. | 1 | 2 | 3 | 4 | 5 | Add wheel and front-end weights. |
| 71. | 1 | 2 | 3 | 4 | 5 | Connect front-end operated equipment. |
| 72. | 1 | 2 | 3 | 4 | 5 | Connect hydraulic systems and hydraulic operated equipment. |
| 73. | 1 | 2 | 3 | 4 | 5 | Connect three-point hitch equipment. |
| 74. | 1 | 2 | 3 | 4 | 5 | Hitch towed equipment. |
| 75. | 1 | 2 | 3 | 4 | 5 | Interpret hand operating signals. |
| 76. | 1 | 2 | 3 | 4 | 5 | Refuel power units. |
| 77. | 1 | 2 | 3 | 4 | 5 | Operate equipment and vehicles on public highways. |
| 78. | 1 | 2 | 3 | 4 | 5 | Use appropriate power equipment for specific purposes. |
| 79. | 1 | 2 | 3 | 4 | 5 | Make proper adjustment to equipment for most efficient operation. |
| 80. | 1 | 2 | 3 | 4 | 5 | Interpret operating instructions in operator's manual. |
| G. | | | | | | Maintaining Equipment and Vehicles |
| 81. | 1 | 2 | 3 | 4 | 5 | Add coolant to cooling systems. |
| 82. | 1 | 2 | 3 | 4 | 5 | Add oil to equipment and vehicles. |
| 83. | 1 | 2 | 3 | 4 | 5 | Adjust carburetors. |
| 84. | 1 | 2 | 3 | 4 | 5 | Adjust clutch pedal free travel. |
| 85. | 1 | 2 | 3 | 4 | 5 | Bleed diesel fuel system. |

| | no | slight | moderate | considerable | complete | TASKS |
|---|---|---|---|---|---|---|
| **G.** | | | | | | Maintaining Equipment and Vehicles (Continued) |
| 86. | 1 | 2 | 3 | 4 | 5 | Change oil and oil filters. |
| 87. | 1 | 2 | 3 | 4 | 5 | Change thermostats. |
| 88. | 1 | 2 | 3 | 4 | 5 | Clean debris from equipment. |
| 89. | 1 | 2 | 3 | 4 | 5 | Grease equipment. |
| 90. | 1 | 2 | 3 | 4 | 5 | Inflate tires. |
| 91. | 1 | 2 | 3 | 4 | 5 | Inspect cooling system for leaks. |
| 92. | 1 | 2 | 3 | 4 | 5 | Install and adjust belts. |
| 93. | 1 | 2 | 3 | 4 | 5 | Install and adjust chains. |
| 94. | 1 | 2 | 3 | 4 | 5 | Install and service battery. |
| 95. | 1 | 2 | 3 | 4 | 5 | Interpret maintenance directions in operator's manuals. |
| 96. | 1 | 2 | 3 | 4 | 5 | Repack bearings. |
| 97. | 1 | 2 | 3 | 4 | 5 | Replace and adjust spark plugs. |
| 98. | 1 | 2 | 3 | 4 | 5 | Replace bearings and seals. |
| 99. | 1 | 2 | 3 | 4 | 5 | Replace diesel fuel nozzles. |
| 100. | 1 | 2 | 3 | 4 | 5 | Replace spark plug wires. |
| 101. | 1 | 2 | 3 | 4 | 5 | Replace radiator hoses. |
| 102. | 1 | 2 | 3 | 4 | 5 | Replace universal joints. |
| 103. | 1 | 2 | 3 | 4 | 5 | Service air cleaners. |
| 104. | 1 | 2 | 3 | 4 | 5 | Service fuel strainer, fuel filters, and sediment bowl on fuel systems. |
| 105. | 1 | 2 | 3 | 4 | 5 | Time engines. |

no slight moderate considerable complete

TASKS

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G. Maintaining Equipment and Vehicles (Continued)

106. 1 2 3 4 5 Prepare equipment for storage.

107. 1 2 3 4 5 Install carburetor repair kit.

H. Inventorying the Farm Business

108. 1 2 3 4 5 Take physical inventory.

109. 1 2 3 4 5 Determine inventory on hand.

110. 1 2 3 4 5 Calculate depreciation.

111. 1 2 3 4 5 Determine when to take inventory.

112. 1 2 3 4 5 Determine salvage values of depreciable assets.

113. 1 2 3 4 5 Establish values on assets, land, buildings, and equipment.

114. 1 2 3 4 5 Identify resources to be inventoried.

115. 1 2 3 4 5 Identify resources which are depreciable and non-depreciable.

I. Planning and Supervising the Labor Supply

116. 1 2 3 4 5 Plan work schedules.

117. 1 2 3 4 5 Establish priorities on work to be completed.

118. 1 2 3 4 5 Identify peak labor periods.

119. 1 2 3 4 5 Determine amount of labor needed.

120. 1 2 3 4 5 Hire and fire workers and perform disciplinary action.

121. 1 2 3 4 5 Train workers to perform tasks.

122. 1 2 3 4 5 Evaluate workers' performance.

| | no | slight | moderate | considerable | complete | TASKS |
|---|---|---|---|---|---|---|
| I. | | | | | | Planning and Supervising the Labor Supply (Continued) |
| 123. | 1 | 2 | 3 | 4 | 5 | Assign specific responsibilities to workers. |
| 124. | 1 | 2 | 3 | 4 | 5 | Establish pay scale and benefits for workers. |
| 125. | 1 | 2 | 3 | 4 | 5 | Identify labor available. |
| 126. | 1 | 2 | 3 | 4 | 5 | Evaluate influence labor utilization has on farm income. |
| 127. | 1 | 2 | 3 | 4 | 5 | Identify ways to reduce inefficient use of labor. |
| 128. | 1 | 2 | 3 | 4 | 5 | Determine whether to hire more labor or hire custom services. |
| 129. | 1 | 2 | 3 | 4 | 5 | Determine whether to do work yourself or hire it done. |
| J. | | | | | | Purchasing Supplies |
| 130. | 1 | 2 | 3 | 4 | 5 | Determine amount to order. |
| 131. | 1 | 2 | 3 | 4 | 5 | Determine what to order. |
| 132. | 1 | 2 | 3 | 4 | 5 | Determine when to order. |
| 133. | 1 | 2 | 3 | 4 | 5 | Compare costs and quality of products from various sources. |
| 134. | 1 | 2 | 3 | 4 | 5 | Determine amount of supplies to keep on hand. |
| 135. | 1 | 2 | 3 | 4 | 5 | Identify sources of supplies. |
| 136. | 1 | 2 | 3 | 4 | 5 | Evaluate future supply needs. |
| K. | | | | | | Insuring the Farm Business |
| 137. | 1 | 2 | 3 | 4 | 5 | Determine the amount of insurance needed. |
| 138. | 1 | 2 | 3 | 4 | 5 | Determine the kind and type of insurance needed. |
| 139. | 1 | 2 | 3 | 4 | 5 | Determine what to insure. |

| | no | slight | moderate | considerable | complete | TASKS |
|---|---|---|---|---|---|---|
| K. | | | | | | Insuring the Farm Business (Continued) |
| 140. | 1 | 2 | 3 | 4 | 5 | Determine when to insure. |
| 141. | 1 | 2 | 3 | 4 | 5 | Evaluate advantages and disadvantages of insurance plans. |
| 142. | 1 | 2 | 3 | 4 | 5 | Identify sources of insurance. |
| L. | | | | | | Planning and Organizing the Farm Business |
| 143. | 1 | 2 | 3 | 4 | 5 | Determine the type of farm to be developed. |
| 144. | 1 | 2 | 3 | 4 | 5 | Determine the size of farm to be developed. |
| 145. | 1 | 2 | 3 | 4 | 5 | Determine whether to have joint ownership. |
| 146. | 1 | 2 | 3 | 4 | 5 | Determine whether to incorporate. |
| 147. | 1 | 2 | 3 | 4 | 5 | Determine whether to participate in government programs. |
| 148. | 1 | 2 | 3 | 4 | 5 | Determine whether to specialize or diversify. |
| 149. | 1 | 2 | 3 | 4 | 5 | Develop overall farm plan. |
| 150. | 1 | 2 | 3 | 4 | 5 | Establish farm family goals. |
| 151. | 1 | 2 | 3 | 4 | 5 | Establish priorities for utilization of resources. |
| 152. | 1 | 2 | 3 | 4 | 5 | Identify improvements to be made. |
| M. | | | | | | Summarizing and Analyzing the Farm Business Records |
| 153. | 1 | 2 | 3 | 4 | 5 | Calculate crop production efficiency factors. |
| 154. | 1 | 2 | 3 | 4 | 5 | Calculate family labor and management income. |
| 155. | 1 | 2 | 3 | 4 | 5 | Calculate investment credit. |
| 156. | 1 | 2 | 3 | 4 | 5 | Calculate labor efficiency factors. |

| | no | slight | moderate | considerable | complete | TASKS |
|---|---|---|---|---|---|---|

M. Summarizing and Analyzing the Farm Business Records (Continued)

| | | | | | | |
|---|---|---|---|---|---|---|
| 157. | 1 | 2 | 3 | 4 | 5 | Calculate machinery use efficiency factors. |
| 158. | 1 | 2 | 3 | 4 | 5 | Calculate management income. |
| 159. | 1 | 2 | 3 | 4 | 5 | Calculate net farm equity. |
| 160. | 1 | 2 | 3 | 4 | 5 | Calculate net farm profit. |
| 161. | 1 | 2 | 3 | 4 | 5 | Calculate net return to capital. |
| 162. | 1 | 2 | 3 | 4 | 5 | Calculate rate of capital turnover. |
| 163. | 1 | 2 | 3 | 4 | 5 | Calculate rate of return to capital. |
| 164. | 1 | 2 | 3 | 4 | 5 | Calculate operating margin. |
| 165. | 1 | 2 | 3 | 4 | 5 | Calculate percent of gross income absorbed by overhead. |
| 166. | 1 | 2 | 3 | 4 | 5 | Close and summarize the cash book at end of year. |
| 167. | 1 | 2 | 3 | 4 | 5 | Complete tax forms. |
| 168. | 1 | 2 | 3 | 4 | 5 | Decide whether to pay taxes on cash or accrual basis. |
| 169. | 1 | 2 | 3 | 4 | 5 | Determine amount of social security to be paid. |
| 170. | 1 | 2 | 3 | 4 | 5 | Determine amount of taxes to be paid. |
| 171. | 1 | 2 | 3 | 4 | 5 | Determine capital gains or losses. |
| 172. | 1 | 2 | 3 | 4 | 5 | Determine the personal and farm share of expenses. |
| 173. | 1 | 2 | 3 | 4 | 5 | Estimate income tax. |
| 174. | 1 | 2 | 3 | 4 | 5 | Identify strengths and weaknesses of farm business. |

N. Marketing Agricultural Products

| | | | | | | |
|---|---|---|---|---|---|---|
| 175. | 1 | 2 | 3 | 4 | 5 | Calculate expected returns and profits on sales. |

| | no | slight | moderate | considerable | complete | TASKS |
|---|---|---|---|---|---|---|
| N. | | | | | | Marketing Agricultural Products (Continued) |
| 176. | 1 | 2 | 3 | 4 | 5 | Determine feasibility of participating in futures market. |
| 177. | 1 | 2 | 3 | 4 | 5 | Select markets. |
| 178. | 1 | 2 | 3 | 4 | 5 | Interpret market reports. |
| 179. | 1 | 2 | 3 | 4 | 5 | Analyze market cycles. |
| 180. | 1 | 2 | 3 | 4 | 5 | Select appropriate marketing system. |
| 181. | 1 | 2 | 3 | 4 | 5 | Determine influence middlemen have on farmer's prices. |
| 182. | 1 | 2 | 3 | 4 | 5 | Determine if products should be held over for another year's income. |
| 183. | 1 | 2 | 3 | 4 | 5 | Determine when to market. |
| 184. | 1 | 2 | 3 | 4 | 5 | Develop marketing plan. |
| 185. | 1 | 2 | 3 | 4 | 5 | Determine influence substitutes have on agricultural products. |
| 186. | 1 | 2 | 3 | 4 | 5 | Determine when products are ready for market. |
| 187. | 1 | 2 | 3 | 4 | 5 | Determine influence supply and demand has on prices. |
| O. | | | | | | Planning Farm Buildings and Structures |
| 188. | 1 | 2 | 3 | 4 | 5 | Calculate construction, remodeling, and repair costs. |
| 189. | 1 | 2 | 3 | 4 | 5 | Determine returns expected from building investments. |
| 190. | 1 | 2 | 3 | 4 | 5 | Determine size of buildings and structures needed. |
| 191. | 1 | 2 | 3 | 4 | 5 | Determine whether permanent or temporary structures should be constructed. |
| 192. | 1 | 2 | 3 | 4 | 5 | Determine whether single purpose or multiple purpose buildings are needed. |

no / slight / moderate / considerable / complete — TASKS

## O. Planning Farm Buildings and Structures (Continued)

193. 1 2 3 4 5 Determine whether to remodel or replace current buildings and structures.

194. 1 2 3 4 5 Determine where to locate buildings and structures.

195. 1 2 3 4 5 Estimate future building and structure needs.

196. 1 2 3 4 5 Evaluate advantages and disadvantages of specific kinds and types of buildings and structures.

197. 1 2 3 4 5 Identify building repairs needed.

198. 1 2 3 4 5 Select type of building materials to be used.

199. 1 2 3 4 5 Work with others in designing and planning buildings and structures.

200. 1 2 3 4 5 Select mechanical systems for use in buildings.

## P. Planning the Farm Equipment and Machinery Program

201. 1 2 3 4 5 Calculate equipment operation costs.

202. 1 2 3 4 5 Determine current conditions of machinery and equipment.

203. 1 2 3 4 5 Determine size of machinery and equipment to purchase.

204. 1 2 3 4 5 Determine what machinery and equipment is needed.

205. 1 2 3 4 5 Determine whether to do custom work for others.

206. 1 2 3 4 5 Determine whether to own machinery or lease it.

207. 1 2 3 4 5 Determine whether to own equipment needed or hire custom work done.

208. 1 2 3 4 5 Determine whether to repair equipment or hire work done.

209. 1 2 3 4 5 Determine whether to repair or trade in equipment and machinery.

P. Planning the Farm Equipment and Machinery Program (Continued)

| | no | slight | moderate | considerable | complete | TASKS |
|---|---|---|---|---|---|---|
| 210. | 1 | 2 | 3 | 4 | 5 | Determine whether to purchase new or used machinery and equipment. |
| 211. | 1 | 2 | 3 | 4 | 5 | Determine returns expected from equipment and machinery investments. |
| 212. | 1 | 2 | 3 | 4 | 5 | Develop regular equipment and machinery maintenance schedule. |
| 213. | 1 | 2 | 3 | 4 | 5 | Evaluate advantages and disadvantages of specific types and brands of equipment and machinery. |
| 214. | 1 | 2 | 3 | 4 | 5 | Evaluate possibility of joint ownership of equipment and machinery. |
| 215. | 1 | 2 | 3 | 4 | 5 | Identify equipment repairs needed. |
| 216. | 1 | 2 | 3 | 4 | 5 | Identify ways to reduce equipment and machinery costs. |

Q. Planning the Livestock Program

| | no | slight | moderate | considerable | complete | TASKS |
|---|---|---|---|---|---|---|
| 217. | 1 | 2 | 3 | 4 | 5 | Determine amount of feed to be purchased in addition to homegrown feeds. |
| 218. | 1 | 2 | 3 | 4 | 5 | Determine resources needed for livestock program. |
| 219. | 1 | 2 | 3 | 4 | 5 | Determine the amount of livestock for the farm. |
| 220. | 1 | 2 | 3 | 4 | 5 | Determine the grade of livestock for the farm. |
| 221. | 1 | 2 | 3 | 4 | 5 | Determine whether to expand or contract the livestock enterprises. |
| 222. | 1 | 2 | 3 | 4 | 5 | Develop livestock planning budgets. |
| 223. | 1 | 2 | 3 | 4 | 5 | Establish livestock enterprise production goals. |
| 224. | 1 | 2 | 3 | 4 | 5 | Identify resources available for the livestock enterprises. |
| 225. | 1 | 2 | 3 | 4 | 5 | Identify special production practices needed to attain production goals. |

CURRICULUM CODE NO. & TITLE T-017 Agricultural Science and Mechanization

| Orig. No. | TASKS | Total No. Responses ( ) | MEAN Group | Emplyr's | ( N ) | Emplye's | ( N ) | Educ's | ( N ) | FREQUENCY ( N ) & PCT. OF FREQUENCY (ADJ.) 1 (N) | 1 Pct. | 2 (N) | 2 Pct. | 3 (N) | 3 Pct. | 4 (N) | 4 Pct. | 5 (N) | 5 Pct. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 588 | Determine light intensity in storage areas. | 175 | 3.36 | 3.36 | 122 | 3.24 | 37 | 3.63 | 16 | 15 | 8.6 | 29 | 16.6 | 47 | 26.9 | 46 | 26.3 | 38 | 21.7 |
| 589 | Check physical condition to determine storability. | 174 | 3.68 | 3.64 | 122 | 3.76 | 37 | 3.87 | 15 | 9 | 5.2 | 19 | 10.9 | 42 | 24.1 | 52 | 29.9 | 52 | 29.9 |
| 590 | Select bed site. | 171 | 4.28 | 4.33 | 120 | 4.14 | 36 | 4.27 | 15 | 5 | 2.9 | 4 | 2.3 | 26 | 15.2 | 39 | 22.8 | 97 | 56.7 |
| 591 | Select profitable variety of tobacco. | 174 | 4.25 | 4.27 | 123 | 4.19 | 36 | 4.20 | 15 | 5 | 2.9 | 5 | 2.9 | 26 | 14.9 | 44 | 25.3 | 94 | 54.0 |
| 592 | Treat land with soil fumigants to control pests and weeds. | 174 | 4.28 | 4.33 | 123 | 4.11 | 36 | 4.20 | 15 | 6 | 3.4 | 3 | 1.7 | 21 | 12.1 | 51 | 29.3 | 93 | 53.4 |
| 593 | Broadcast proper analysis and amount of fertilizer. | 174 | 4.24 | 4.29 | 123 | 4.03 | 36 | 4.27 | 15 | 7 | 4.0 | 1 | 0.6 | 26 | 14.7 | 50 | 28.2 | 90 | 50.8 |
| 594 | Seed the plant bed. | 174 | 4.28 | 4.33 | 123 | 4.19 | 36 | 4.00 | 15 | 7 | 4.0 | 3 | 1.7 | 20 | 11.5 | 49 | 28.2 | 95 | 54.6 |
| 595 | Dig drainage ditches. | 175 | 3.83 | 3.89 | 123 | 3.70 | 37 | 3.60 | 15 | 5 | 2.9 | 18 | 16.3 | 41 | 23.4 | 49 | 28.0 | 62 | 35.4 |
| 596 | Select and use proper bed cover. | 175 | 4.06 | 4.11 | 123 | 3.97 | 37 | 3.87 | 15 | 5 | 2.9 | 7 | 4.0 | 38 | 21.7 | 47 | 26.9 | 78 | 44.6 |
| 597 | Apply treatment for mold. | 175 | 4.09 | 4.11 | 123 | 4.08 | 37 | 3.93 | 15 | 4 | 2.3 | 10 | 5.7 | 32 | 18.3 | 49 | 28.0 | 80 | 45.7 |
| 598 | Identify and apply chemicals for plant bed diseases. | 175 | 4.22 | 4.28 | 123 | 4.05 | 37 | 4.13 | 15 | 5 | 2.9 | 7 | 4.0 | 22 | 12.6 | 52 | 29.7 | 89 | 50.9 |
| 599 | Weed the bed. | 175 | 3.79 | 3.78 | 123 | 3.87 | 37 | 3.67 | 15 | 12 | 6.9 | 18 | 10.3 | 34 | 19.4 | 42 | 24.0 | 69 | 39.4 |
| 600 | Irrigate the bed. | 174 | 3.97 | 3.98 | 122 | 3.97 | 37 | 3.87 | 15 | 6 | 3.4 | 12 | 6.9 | 39 | 22.4 | 42 | 24.1 | 75 | 43.1 |
| 601 | Spray bed for worms. | 172 | 3.98 | 3.99 | 121 | 3.95 | 37 | 3.93 | 14 | 8 | 4.7 | 10 | 5.8 | 37 | 21.5 | 40 | 23.3 | 77 | 44.8 |
| 602 | Treat land for nematodes and apply pre-emergent herbicides and fertilizers. | 172 | 4.26 | 4.28 | 120 | 4.24 | 37 | 4.20 | 15 | 4 | 2.3 | 7 | 4.1 | 20 | 11.6 | 50 | 29.1 | 91 | 52.9 |
| 603 | Select proper size transplants. | 175 | 4.13 | 4.20 | 123 | 3.95 | 37 | 4.00 | 15 | 5 | 2.9 | 7 | 4.0 | 26 | 14.9 | 60 | 34.3 | 77 | 44.0 |
| 604 | Transplant tobacco. | 175 | 4.15 | 4.19 | 123 | 4.11 | 37 | 3.93 | 15 | 6 | 3.4 | 9 | 5.1 | 26 | 14.9 | 46 | 26.3 | 88 | 50.3 |
| 605 | Apply top-dressing. | 175 | 4.11 | 4.15 | 123 | 4.08 | 37 | 3.93 | 15 | 5 | 2.9 | 9 | 5.1 | 24 | 13.7 | 60 | 34.3 | 77 | 44.0 |
| 606 | Cut tops from tobacco. | 175 | 4.17 | 4.22 | 123 | 4.03 | 37 | 4.07 | 15 | 4 | 2.3 | 11 | 6.3 | 24 | 13.7 | 49 | 28.0 | 87 | 49.7 |
| 607 | Remove suckers and spray to prevent further growth. | 173 | 4.24 | 4.31 | 121 | 4.08 | 37 | 4.07 | 15 | 4 | 2.3 | 8 | 4.6 | 22 | 12.7 | 47 | 27.2 | 92 | 53.2 |
| 608 | Cultivate tobacco. | 171 | 4.21 | 4.28 | 120 | 4.08 | 37 | 4.00 | 14 | 7 | 4.1 | 5 | 2.9 | 25 | 14.6 | 42 | 24.6 | 92 | 53.8 |
| 609 | Determine most profitable method of harvesting. | 172 | 4.21 | 4.35 | 120 | 3.81 | 37 | 4.07 | 15 | 6 | 3.5 | 3 | 1.7 | 23 | 13.4 | 57 | 33.1 | 83 | 48.3 |

RRICULUM CODE NO. & TITLE T-017 Agricultural Science and M ation

| Orig. No. | TASKS | Total No. Responses ( ) | MEAN Group | MEAN Emplyr's | ( N ) | MEAN Emplye's | ( N ) | MEAN Educ's | ( N ) | FREQUENCY ( N ) & PCT. OF FREQUENCY (ADJ.) 1 (N) | 1 Pct. | 2 (N) | 2 Pct. | 3 (N) | 3 Pct. | 4 (N) | 4 Pct. | 5 (N) | 5 Pct. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 610 | Determine proper ripeness. | 175 | 4.26 | 4.33 | 123 | 4.00 | 37 | 4.33 | 15 | 5 | 2.9 | 4 | 2.3 | 24 | 13.7 | 50 | 28.6 | 92 | 52.6 |
| 611 | Determine most profitable method of curing. | 175 | 4.23 | 4.31 | 123 | 4.00 | 37 | 4.13 | 15 | 6 | 3.4 | 7 | 4.0 | 20 | 11.4 | 50 | 28.6 | 92 | 52.6 |
| 612 | Maintain yellowing heat in barn. | 175 | 4.21 | 4.25 | 123 | 4.05 | 37 | 4.20 | 15 | 5 | 2.9 | 3 | 1.7 | 27 | 15.4 | 56 | 32.0 | 84 | 48.0 |
| 613 | Increase heat to dry the leaf and stems. | 175 | 4.27 | 4.29 | 123 | 4.24 | 37 | 4.20 | 15 | 5 | 2.9 | 1 | 0.6 | 27 | 15.4 | 50 | 28.6 | 92 | 52.6 |
| 614 | Return moisture to prevent shattering. | 175 | 4.15 | 4.19 | 123 | 4.05 | 37 | 4.13 | 15 | 4 | 2.3 | 3 | 1.7 | 33 | 18.9 | 57 | 32.6 | 78 | 44.6 |
| 615 | Determine proper method of storage. | 175 | 4.09 | 4.13 | 123 | 4.00 | 37 | 4.00 | 15 | 4 | 2.3 | 4 | 2.3 | 37 | 21.1 | 57 | 32.6 | 73 | 41.7 |
| 616 | Maintain dry and pest-free storage facilities. | 175 | 4.09 | 4.11 | 123 | 4.03 | 37 | 4.07 | 15 | 5 | 2.9 | 6 | 3.4 | 35 | 20.0 | 51 | 29.1 | 78 | 44.6 |
| 617 | Use a wet-bulb thermometer to help regulate ventilation. | 175 | 3.80 | 3.85 | 123 | 3.54 | 37 | 4.07 | 15 | 10 | 5.7 | 11 | 6.3 | 42 | 24.0 | 53 | 30.3 | 59 | 33.7 |
| 618 | Transport tobacco to curing barns. | 175 | 3.83 | 3.89 | 123 | 3.68 | 37 | 3.73 | 15 | 7 | 4.0 | 16 | 9.1 | 47 | 26.9 | 35 | 20.0 | 70 | 40.0 |
| 619 | String tobacco on sticks or place in bulk racks or boxes. | 173 | 3.99 | 4.06 | 121 | 3.87 | 37 | 3.80 | 15 | 6 | 3.5 | 12 | 6.9 | 33 | 19.1 | 48 | 27.7 | 74 | 42.8 |
| 620 | Hang sticks on tiers or place bulk containers properly in barn. | 170 | 3.99 | 4.03 | 119 | 3.92 | 37 | 3.86 | 14 | 7 | 4.1 | 13 | 7.6 | 35 | 20.6 | 35 | 20.6 | 80 | 47.1 |
| 621 | Determine best market and warehouse. | 171 | 4.02 | 4.02 | 119 | 4.05 | 37 | 4.00 | 15 | 5 | 2.9 | 8 | 4.7 | 33 | 19.3 | 57 | 33.3 | 68 | 39.8 |
| 622 | Prepare the tobacco for marketing. | 175 | 4.24 | 4.24 | 123 | 4.22 | 37 | 4.33 | 15 | 4 | 2.3 | 3 | 1.7 | 27 | 15.4 | 54 | 30.9 | 87 | 49.7 |
| 623 | Determine optimum time to sell different grades. | 175 | 3.97 | 3.93 | 123 | 4.00 | 37 | 4.20 | 15 | 5 | 2.9 | 8 | 4.6 | 42 | 24.0 | 53 | 30.3 | 67 | 38.3 |
| 624 | Properly sheets tobacco. | 175 | 4.02 | 3.99 | 123 | 4.03 | 37 | 4.27 | 15 | 4 | 2.3 | 10 | 5.7 | 40 | 22.9 | 45 | 25.7 | 76 | 43.4 |
| 625 | Deliver tobacco to warehouse. | 175 | 3.77 | 3.78 | 123 | 3.70 | 37 | 3.80 | 15 | 9 | 5.1 | 19 | 10.9 | 45 | 25.7 | 33 | 18.9 | 69 | 39.4 |
| 626 | Has tobacco weighed in. | 175 | 3.74 | 3.71 | 123 | 3.84 | 37 | 3.80 | 15 | 7 | 4.0 | 23 | 13.1 | 48 | 27.4 | 27 | 15.4 | 70 | 40.0 |
| 627 | Observe government graders. | 174 | 4.01 | 4.03 | 122 | 3.95 | 37 | 3.93 | 15 | 5 | 2.9 | 11 | 6.3 | 34 | 19.5 | 52 | 29.9 | 72 | 41.4 |
| 628 | Determine whether to accept the price or keep the tobacco and sell it at a later date. | 172 | 4.18 | 4.20 | 121 | 4.03 | 37 | 4.43 | 14 | 4 | 2.3 | 6 | 3.5 | 26 | 15.1 | 55 | 32.0 | 81 | 47.1 |
| 629 | Determine appropriate soil mix for specific plants. | 172 | 3.58 | 3.57 | 119 | 3.49 | 37 | 3.88 | 16 | 16 | 9.3 | 11 | 6.4 | 48 | 27.9 | 51 | 29.7 | 46 | 26.7 |
| 630 | Determine soil texture. | 177 | 3.57 | 3.50 | 123 | 3.68 | 38 | 3.81 | 16 | 15 | 8.5 | 11 | 6.2 | 51 | 28.8 | 58 | 32.8 | 42 | 23.7 |
| 631 | Evaluate physical, chemical, and biological effects steam has on soil. | 177 | 3.36 | 3.31 | 123 | 3.67 | 38 | 3.75 | 16 | 18 | 10.2 | 20 | 11.3 | 50 | 28.2 | 58 | 32.8 | 31 | 17.5 |

CURRICULUM CODE NO. & TITLE T-017 Agricultural Science and Mechanization

| Orig. No. | TASKS | Total No. Responses ( ) | MEAN Group | Emplyr's | ( N ) | Emplye's | ( N ) | Educ's | ( N ) | FREQUENCY ( N ) & PCT. OF FREQUENCY (ADJ.) 1 (N) | 1 Pct. | 2 (N) | 2 Pct. | 3 (N) | 3 Pct. | 4 (N) | 4 Pct. | 5 (N) | 5 Pct. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 632 | Fill benches and pots. | 177 | 3.17 | 3.07 | 123 | 3.26 | 38 | 3.75 | 16 | 17 | 9.6 | 36 | 20.3 | 51 | 28.8 | 46 | 26.0 | 27 | 15.3 |
| 633 | Fill soil bins. | 177 | 3.11 | 3.02 | 123 | 3.11 | 38 | 3.88 | 16 | 24 | 13.6 | 31 | 17.5 | 52 | 29.4 | 41 | 23.2 | 29 | 16.4 |
| 634 | Identify greenhouse soil materials. | 176 | 3.23 | 3.14 | 122 | 3.16 | 38 | 4.06 | 16 | 24 | 13.6 | 30 | 17.0 | 46 | 26.1 | 34 | 19.3 | 42 | 23.9 |
| 635 | Level soil surface. | 177 | 3.12 | 3.02 | 123 | 3.34 | 38 | 3.38 | 16 | 26 | 14.7 | 35 | 19.8 | 47 | 26.6 | 30 | 16.9 | 39 | 22.0 |
| 636 | Mark soil for planting. | 177 | 3.18 | 3.13 | 123 | 3.18 | 38 | 3.50 | 16 | 27 | 15.3 | 28 | 15.8 | 46 | 26.0 | 39 | 22.0 | 37 | 20.9 |
| 637 | Mix soil with appropriate plant growing materials. | 177 | 3.22 | 3.13 | 123 | 3.24 | 38 | 3.81 | 16 | 20 | 11.3 | 32 | 18.1 | 49 | 27.7 | 42 | 23.7 | 34 | 19.2 |
| 638 | Prepare compost. | 177 | 3.15 | 3.05 | 123 | 3.24 | 38 | 3.69 | 16 | 23 | 13.0 | 34 | 19.2 | 46 | 26.0 | 42 | 23.7 | 32 | 18.1 |
| 639 | Shred or screen soil. | 177 | 2.97 | 2.86 | 123 | 3.05 | 38 | 3.63 | 16 | 29 | 16.4 | 37 | 20.9 | 48 | 27.1 | 36 | 20.3 | 27 | 15.3 |
| 640 | Spread peat moss on top of soil mix. | 177 | 3.01 | 2.91 | 123 | 3.21 | 38 | 3.31 | 16 | 33 | 18.6 | 30 | 16.9 | 45 | 25.4 | 40 | 22.6 | 29 | 16.4 |
| 641 | Steam soil. | 175 | 2.93 | 2.79 | 121 | 3.03 | 38 | 3.75 | 16 | 39 | 22.3 | 25 | 14.3 | 49 | 28.0 | 34 | 19.4 | 28 | 16.0 |
| 642 | Sterilize mixed soils with chemicals and heat. | 173 | 3.08 | 2.93 | 120 | 3.21 | 38 | 4.00 | 15 | 34 | 19.7 | 23 | 13.3 | 43 | 24.9 | 41 | 23.7 | 32 | 18.5 |
| 643 | Alter spacing of plants. | 172 | 3.30 | 3.19 | 119 | 3.46 | 37 | 3.75 | 16 | 25 | 14.5 | 24 | 14.0 | 39 | 22.7 | 43 | 25.0 | 41 | 23.8 |
| 644 | Apply shading compound to glass. | 177 | 3.07 | 3.93 | 123 | 3.32 | 38 | 3.56 | 16 | 31 | 17.5 | 31 | 17.5 | 41 | 23.2 | 43 | 24.3 | 31 | 17.5 |
| 645 | Basin plants for watering. | 177 | 3.12 | 2.97 | 123 | 3.40 | 38 | 3.69 | 16 | 30 | 16.9 | 27 | 15.3 | 45 | 25.4 | 41 | 23.2 | 34 | 19.2 |
| 646 | Control air temperature. | 177 | 3.23 | 3.12 | 123 | 3.42 | 38 | 3.63 | 16 | 26 | 14.7 | 22 | 12.4 | 47 | 26.6 | 49 | 27.7 | 33 | 18.6 |
| 647 | Control humidity. | 177 | 3.21 | 3.11 | 123 | 3.37 | 38 | 3.63 | 16 | 26 | 14.7 | 23 | 13.0 | 50 | 28.2 | 44 | 24.9 | 34 | 19.2 |
| 648 | Control light quantity and quality. | 177 | 3.24 | 3.17 | 123 | 3.26 | 38 | 3.75 | 16 | 26 | 14.7 | 25 | 14.1 | 44 | 24.9 | 44 | 24.9 | 38 | 21.5 |
| 649 | Determine appropriate temperatures for various plants. | 177 | 3.23 | 3.15 | 123 | 3.26 | 38 | 3.69 | 16 | 28 | 15.8 | 20 | 11.3 | 45 | 25.4 | 52 | 21.4 | 32 | 18.1 |
| 650 | Evaluate affect temperature has on plants. | 177 | 3.27 | 3.20 | 123 | 3.34 | 38 | 3.63 | 16 | 22 | 12.4 | 27 | 15.3 | 43 | 24.3 | 52 | 29.4 | 33 | 18.6 |
| 651 | Evaluate influence relative humidity has on plant growth. | 177 | 3.23 | 3.15 | 123 | 3.34 | 38 | 3.56 | 16 | 22 | 12.4 | 29 | 16.4 | 45 | 25.4 | 48 | 27.1 | 33 | 18.6 |
| 652 | Hang lath or saran cloth. | 177 | 2.98 | 2.89 | 123 | 3.05 | 38 | 3.50 | 16 | 34 | 19.2 | 28 | 15.8 | 49 | 27.7 | 39 | 22.0 | 27 | 15.3 |
| 653 | Interpret light meters. | 177 | 3.09 | 2.96 | 123 | 3.24 | 38 | 3.75 | 16 | 33 | 18.6 | 29 | 16.4 | 38 | 21.5 | 43 | 24.3 | 34 | 19.2 |
| 654 | Mist plants. | 177 | 3.12 | 2.98 | 123 | 3.32 | 38 | 3.81 | 16 | 32 | 18.1 | 27 | 15.3 | 43 | 24.3 | 37 | 20.9 | 38 | 21.5 |
| 655 | Set automatic water timers. | 177 | 3.19 | 3.08 | 123 | 3.26 | 38 | 3.81 | 16 | 30 | 16.9 | 26 | 14.7 | 44 | 24.9 | 35 | 19.8 | 42 | 23.7 |

CURRICULUM CODE NO. & TITLE T-017 Agricultural Science and Mechanization

| Orig. No. | TASKS | Total No. Responses | MEAN | | | | | | | FREQUENCY ( N ) & PCT. OF FREQUENCY (ADJ.) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | ( ) | Group | Emplyr's | ( N ) | Emplye's | ( N ) | Educ's | ( N ) | 1 (N) | 1 Pct. | 2 (N) | 2 Pct. | 3 (N) | 3 Pct. | 4 (N) | 4 Pct. | 5 (N) | 5 Pct. |
| 656 | Water greenhouse plants. | 175 | 3.26 | 3.14 | 121 | 3.45 | 38 | 3.69 | 16 | 30 | 17.1 | 21 | 12.0 | 43 | 24.6 | 36 | 20.6 | 45 | 25.7 |
| 657 | Set automatic light timers. | 173 | 3.14 | 3.01 | 120 | 3.21 | 38 | 4.00 | 15 | 36 | 20.8 | 19 | 11.0 | 41 | 23.7 | 39 | 22.5 | 38 | 22.0 |
| 658 | Locate proper specifications for equipment. | 169 | 4.12 | 4.11 | 116 | 4.30 | 37 | 3.75 | 16 | 1 | 0.6 | 6 | 3.6 | 35 | 20.7 | 57 | 33.7 | 70 | 41.4 |
| 659 | Interpret sketches and diagrams. | 174 | 3.93 | 3.90 | 120 | 4.00 | 38 | 4.00 | 16 | 3 | 1.7 | 11 | 6.3 | 45 | 25.9 | 51 | 29.3 | 64 | 36.8 |
| 660 | Follow written repair procedures. | 173 | 4.00 | 3.99 | 120 | 4.03 | 38 | 4.00 | 15 | 2 | 1.2 | 10 | 5.8 | 40 | 23.1 | 55 | 31.8 | 66 | 38.2 |
| 661 | Determine how breakages or defects in specific parts influence overall operation of equipment. | 169 | 3.89 | 3.91 | 117 | 3.84 | 37 | 3.87 | 15 | 2 | 1.2 | 10 | 5.9 | 46 | 27.2 | 58 | 34.3 | 53 | 31.4 |
| 662 | Determine potential causes of equipment failure. | 176 | 3.92 | 3.91 | 122 | 3.95 | 38 | 3.94 | 16 | 3 | 1.7 | 9 | 5.1 | 48 | 27.3 | 55 | 31.3 | 61 | 34.7 |
| 663 | Visually inspect for defects. | 177 | 3.98 | 3.94 | 123 | 4.08 | 38 | 4.00 | 16 | 2 | 1.1 | 9 | 5.1 | 48 | 27.1 | 50 | 28.2 | 68 | 38.4 |
| 664 | Recommend appropriate parts needed to correct equipment malfunctions. | 177 | 4.01 | 4.01 | 123 | 4.00 | 38 | 4.00 | 16 | 3 | 1.7 | 8 | 4.5 | 44 | 24.9 | 52 | 29.4 | 70 | 39.5 |
| 665 | Follow troubleshooting procedures in service manuals. | 173 | 4.06 | 4.07 | 120 | 4.05 | 37 | 4.00 | 16 | 2 | 1.2 | 8 | 4.6 | 41 | 23.7 | 49 | 28.3 | 73 | 42.2 |
| 666 | Run dynamometer test. | 177 | 3.27 | 3.24 | 123 | 3.42 | 38 | 3.13 | 16 | 29 | 16.4 | 19 | 10.7 | 39 | 22.0 | 55 | 31.1 | 35 | 19.8 |
| 667 | Use oscilloscope and engine analyzer to test engine. | 176 | 3.23 | 3.21 | 122 | 3.29 | 38 | 3.19 | 16 | 27 | 15.3 | 26 | 14.8 | 44 | 25.0 | 38 | 21.6 | 41 | 23.3 |
| 668 | Use hydraulic system tester on hydraulic system. | 172 | 3.25 | 3.22 | 119 | 3.32 | 38 | 3.33 | 15 | 27 | 15.7 | 21 | 12.2 | 41 | 23.8 | 48 | 27.9 | 35 | 20.3 |
| 669 | Adjust mechanical brakes. | 170 | 3.91 | 3.97 | 117 | 3.81 | 37 | 3.69 | 16 | 44 | 2.4 | 19 | 11.2 | 28 | 16.5 | 57 | 33.5 | 62 | 36.5 |
| 670 | Adjust power brakes. | 176 | 3.75 | 3.80 | 122 | 3.61 | 38 | 3.69 | 16 | 8 | 4.5 | 23 | 13.1 | 34 | 19.3 | 51 | 29.0 | 60 | 34.1 |
| 671 | Bleed power brakes. | 177 | 3.76 | 3.82 | 123 | 3.68 | 38 | 3.50 | 16 | 11 | 6.2 | 23 | 13.0 | 28 | 15.8 | 50 | 28.2 | 65 | 36.7 |
| 672 | Inspect backing plate, brake disk, pressure plates and brake pistons. | 177 | 3.76 | 3.78 | 123 | 3.79 | 38 | 3.56 | 16 | 11 | 6.2 | 22 | 12.4 | 28 | 15.8 | 33 | 29.9 | 63 | 35.6 |
| 673 | Replace brake lining. | 177 | 3.75 | 3.80 | 123 | 3.71 | 38 | 3.50 | 16 | 11 | 6.2 | 15 | 8.5 | 39 | 22.0 | 54 | 30.5 | 58 | 32.8 |
| 674 | Replace brake springs, pins, and/or balls. | 177 | 3.70 | 3.76 | 123 | 3.55 | 38 | 3.50 | 16 | 11 | 6.2 | 18 | 10.2 | 43 | 24.3 | 47 | 26.6 | 58 | 32.8 |
| 675 | Remove and install cylinders, shoes, and disk. | 176 | 3.71 | 3.75 | 122 | 3.66 | 38 | 3.50 | 16 | 12 | 6.8 | 16 | 9.1 | 41 | 23.3 | 49 | 27.8 | 58 | 33.0 |
| 676 | Test brakes after adjustment. | 173 | 3.75 | 3.79 | 120 | 3.61 | 38 | 3.73 | 15 | 11 | 6.4 | 18 | 10.4 | 34 | 19.7 | 51 | 29.5 | 59 | 34.1 |
| 677 | Adjust track tension. | 173 | 3.47 | 3.49 | 119 | 3.42 | 38 | 3.50 | 16 | 22 | 12.7 | 19 | 11.0 | 38 | 22.0 | 43 | 24.9 | 51 | 29.5 |

CURRICULUM CODE NO. & TITLE T-017 Agricultural Science and Mechanization

| Orig. No. | TASKS | Total No. Responses ( ) | MEAN Group | Emplyr's | ( N ) | Emplye's | ( N ) | Educ's | ( N ) | FREQUENCY ( N ) & PCT. OF FREQUENCY (ADJ.) 1 (N) | Pct. | 2 (N) | Pct. | 3 (N) | Pct. | 4 (N) | Pct. | 5 (N) | Pct. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 678 | Adjust wheel bearings. | 177 | 3.71 | 3.69 | 123 | 3.74 | 38 | 3.75 | 16 | 9 | 5.1 | 22 | 12.4 | 40 | 22.6 | 47 | 26.6 | 59 | 33.3 |
| 679 | Adjust wheel width. | 177 | 3.86 | 3.89 | 123 | 3.76 | 38 | 3.88 | 16 | 5 | 2.8 | 11 | 6.2 | 51 | 28.8 | 46 | 26.0 | 64 | 36.2 |
| 680 | Inflate tires. | 177 | 3.92 | 3.87 | 123 | 4.08 | 38 | 3.88 | 16 | 5 | 2.8 | 19 | 10.7 | 40 | 22.6 | 35 | 19.8 | 78 | 44.1 |
| 681 | Inspect bearings and seals. | 177 | 3.81 | 3.85 | 123 | 3.74 | 38 | 3.75 | 16 | 6 | 3.4 | 18 | 10.2 | 43 | 24.3 | 46 | 26.0 | 64 | 36.2 |
| 682 | Inspect track pins and bushings. | 176 | 3.62 | 3.63 | 123 | 3.58 | 38 | 3.67 | 15 | 14 | 8.0 | 23 | 13.1 | 39 | 22.2 | 40 | 22.7 | 60 | 34.1 |
| 683 | Load tires with liquid. | 177 | 3.81 | 3.81 | 123 | 3.87 | 38 | 3.63 | 16 | 4 | 2.3 | 21 | 11.9 | 41 | 23.2 | 50 | 28.2 | 61 | 34.5 |
| 684 | Patch tubes. | 177 | 3.69 | 3.76 | 123 | 3.63 | 38 | 3.31 | 16 | 10 | 5.6 | 22 | 12.4 | 48 | 27.1 | 30 | 16.9 | 67 | 37.9 |
| 685 | Remove and install track. | 177 | 3.42 | 3.42 | 123 | 3.53 | 38 | 3.13 | 16 | 20 | 11.3 | 27 | 15.3 | 40 | 22.6 | 39 | 22.0 | 51 | 28.8 |
| 686 | Repack wheel bearings. | 177 | 3.93 | 3.96 | 123 | 4.00 | 38 | 3.50 | 16 | 5 | 2.8 | 16 | 9.0 | 35 | 19.8 | 52 | 29.4 | 69 | 39.0 |
| 687 | Replace wheel bearings and seals. | 175 | 3.93 | 3.99 | 122 | 3.95 | 38 | 3.40 | 15 | 6 | 3.4 | 14 | 8.0 | 41 | 23.4 | 39 | 22.3 | 75 | 42.9 |
| 688 | Adjust steering gear bearings. | 173 | 3.47 | 3.49 | 119 | 3.45 | 38 | 3.44 | 16 | 16 | 9.2 | 15 | 8.7 | 55 | 31.8 | 45 | 26.0 | 42 | 24.3 |
| 689 | Adjust toe-in, drag link, and turning angle. | 177 | 3.55 | 3.56 | 123 | 3.40 | 38 | 3.81 | 16 | 18 | 10.2 | 14 | 7.9 | 48 | 27.1 | 47 | 26.6 | 50 | 28.2 |
| 690 | Bleed power steering system. | 176 | 3.54 | 3.57 | 123 | 3.30 | 37 | 3.88 | 16 | 15 | 8.5 | 26 | 14.8 | 35 | 19.9 | 49 | 27.8 | 51 | 29.0 |
| 691 | Inspect power steering motor assembly. | 177 | 3.49 | 3.49 | 123 | 3.32 | 38 | 3.88 | 16 | 18 | 10.2 | 18 | 10.2 | 47 | 26.6 | 48 | 27.1 | 46 | 26.0 |
| 692 | Inspect power steering system for leaks. | 177 | 3.63 | 3.66 | 123 | 3.40 | 38 | 4.00 | 16 | 9 | 5.1 | 20 | 11.3 | 53 | 29.9 | 40 | 22.6 | 55 | 31.1 |
| 693 | Inspect power steering valve assembly. | 177 | 3.24 | 3.46 | 123 | 3.21 | 38 | 3.69 | 16 | 19 | 10.7 | 22 | 12.4 | 45 | 25.4 | 47 | 26.6 | 44 | 24.9 |
| 694 | Inspect steering gears. | 170 | 3.48 | 3.50 | 123 | 3.21 | 38 | 3.94 | 16 | 17 | 9.6 | 22 | 12.4 | 46 | 26.0 | 44 | 24.9 | 48 | 27.1 |
| 695 | Install and adjust power steering pump belt tension. | 177 | 3.61 | 3.64 | 123 | 3.32 | 38 | 4.00 | 16 | 15 | 8.5 | 15 | 8.5 | 52 | 29.4 | 38 | 21.5 | 57 | 32.2 |
| 696 | Remove and install ball joints. | 177 | 3.54 | 3.58 | 123 | 3.42 | 38 | 3.50 | 16 | 19 | 10.7 | 21 | 11.9 | 39 | 22.0 | 42 | 23.7 | 56 | 31.6 |
| 697 | Remove and install power steering motor. | 177 | 3.51 | 3.57 | 123 | 3.34 | 38 | 3.44 | 16 | 17 | 9.6 | 23 | 13.0 | 42 | 23.7 | 43 | 24.3 | 52 | 29.4 |
| 698 | Repair power steering valve assembly. | 177 | 3.32 | 3.37 | 123 | 3.16 | 38 | 3.38 | 16 | 26 | 14.7 | 21 | 11.9 | 44 | 24.9 | 42 | 23.7 | 44 | 24.9 |
| 699 | Remove and install power steering valve assembly. | 177 | 3.32 | 3.35 | 123 | 3.18 | 38 | 3.44 | 16 | 26 | 14.7 | 22 | 12.4 | 44 | 24.9 | 39 | 22.0 | 46 | 26.0 |
| 700 | Remove and install tie rods. | 177 | 3.52 | 3.58 | 123 | 3.26 | 38 | 3.69 | 16 | 15 | 8.5 | 21 | 11.9 | 52 | 29.4 | 35 | 19.8 | 54 | 30.5 |
| 701 | Repair power steering motor. | 177 | 3.32 | 3.31 | 123 | 3.34 | 38 | 3.38 | 16 | 30 | 16.9 | 20 | 11.3 | 40 | 22.6 | 37 | 20.9 | 50 | 28.2 |
| 702 | Replace steering gears and knuckles. | 175 | 3.37 | 3.40 | 122 | 3.24 | 37 | 3.38 | 16 | 26 | 14.9 | 21 | 12.0 | 39 | 22.3 | 41 | 23.4 | 48 | 27.4 |

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RRICULUM CODE NO. & TITLE T-017 Agricultural Science and Mec tion

| Orig. No. | TASKS | Total No. Responses | MEAN | | | | | | | FREQUENCY ( N ) & PCT. OF FREQUENCY (ADJ.) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | ( ) | Group | Emplyr's | ( N ) | Emplye's | ( N ) | Educ's | ( N ) | 1 (N) | Pct. | 2 (N) | Pct. | 3 (N) | Pct. | 4 (N) | Pct. | 5 (N) | Pct. |
| 703 | Add hydraulic oil to system. | 172 | 3.93 | 3.98 | 119 | 3.70 | 37 | 4.06 | 16 | 5 | 2.9 | 18 | 10.5 | 34 | 19.8 | 42 | 24.4 | 72 | 42.4 |
| 704 | Bleed hydraulic system or remove cylinders. | 177 | 3.81 | 3.85 | 123 | 3.63 | 38 | 4.00 | 16 | 5 | 2.8 | 23 | 13.0 | 38 | 21.5 | 45 | 25.4 | 66 | 37.3 |
| 705 | Determine purpose of hydraulic system parts. | 177 | 3.56 | 3.61 | 123 | 3.50 | 38 | 3.31 | 16 | 9 | 5.1 | 30 | 16.9 | 41 | 23.2 | 47 | 26.6 | 50 | 28.2 |
| 706 | Diagnose pump failures. | 177 | 3.65 | 3.72 | 123 | 3.58 | 38 | 3.31 | 16 | 10 | 5.6 | 20 | 11.3 | 41 | 23.2 | 57 | 32.2 | 49 | 27.7 |
| 707 | Drain, clean, flush, and refill hydraulic system. | 177 | 3.87 | 3.85 | 123 | 3.84 | 38 | 4.13 | 16 | 4 | 2.3 | 18 | 10.2 | 39 | 22.0 | 52 | 29.4 | 64 | 36.2 |
| 708 | Evaluate influence contaminants have on operation of hydraulic system. | 177 | 3.61 | 3.67 | 123 | 3.53 | 38 | 3.31 | 16 | 11 | 6.2 | 19 | 10.7 | 51 | 28.8 | 44 | 24.9 | 52 | 29.4 |
| 709 | Identify parts of hydraulic systems. | 177 | 3.57 | 3.57 | 123 | 3.58 | 38 | 3.50 | 16 | 14 | 7.9 | 23 | 13.0 | 41 | 23.2 | 47 | 26.6 | 52 | 29.4 |
| 710 | Identify types of hydraulic pumps. | 177 | 3.42 | 3.50 | 123 | 3.29 | 38 | 3.13 | 16 | 18 | 10.2 | 24 | 13.6 | 44 | 24.9 | 47 | 26.6 | 44 | 24.9 |
| 711 | Identify types of hydraulic systems. | 176 | 3.47 | 3.54 | 122 | 3.32 | 38 | 3.25 | 16 | 15 | 8.5 | 24 | 13.6 | 48 | 27.3 | 42 | 23.9 | 47 | 26.7 |
| 712 | Inspect and clean oil cooler. | 176 | 3.73 | 3.76 | 122 | 3.63 | 38 | 3.69 | 16 | 10 | 5.7 | 17 | 9.7 | 43 | 24.4 | 47 | 26.7 | 59 | 33.5 |
| 713 | Inspect components of pumps and motors. | 176 | 3.49 | 3.54 | 122 | 3.67 | 38 | 3.44 | 16 | 14 | 8.0 | 21 | 11.9 | 50 | 28.4 | 46 | 26.1 | 45 | 25.6 |
| 714 | Inspect hydraulic valves and valve spring. | 176 | 3.50 | 3.54 | 122 | 3.18 | 38 | 3.38 | 16 | 15 | 8.5 | 22 | 12.5 | 49 | 27.8 | 49 | 27.8 | 41 | 23.3 |
| 715 | Install O-rings, seals, and packing. | 177 | 3.58 | 3.59 | 123 | 3.61 | 38 | 3.50 | 16 | 13 | 7.3 | 21 | 11.9 | 44 | 24.9 | 48 | 27.1 | 51 | 28.8 |
| 716 | Locate internal and external leakage problems. | 177 | 3.59 | 3.61 | 123 | 3.40 | 38 | 3.88 | 16 | 13 | 7.3 | 17 | 9.6 | 54 | 30.5 | 39 | 22.0 | 54 | 30.5 |
| 717 | Measure pump and motor tolerances. | 175 | 3.25 | 3.27 | 121 | 3.16 | 38 | 3.25 | 16 | 26 | 14.9 | 25 | 14.3 | 44 | 25.1 | 40 | 22.9 | 40 | 22.9 |
| 718 | Read schematic of hydraulic systems. | 177 | 3.38 | 3.42 | 123 | 3.18 | 38 | 3.56 | 16 | 17 | 9.6 | 30 | 16.9 | 43 | 24.3 | 43 | 24.3 | 44 | 24.9 |
| 719 | Remove and install hydraulic hoses or tubing. | 177 | 3.75 | 3.74 | 123 | 3.66 | 38 | 4.00 | 16 | 10 | 5.6 | 16 | 9.0 | 43 | 24.3 | 48 | 27.1 | 60 | 33.9 |
| 720 | Remove and install hydraulic pumps. | 177 | 3.60 | 3.67 | 123 | 3.50 | 38 | 3.31 | 16 | 14 | 7.9 | 20 | 11.3 | 46 | 26.0 | 40 | 22.6 | 57 | 32.2 |
| 721 | Remove and install hydraulic oil cooler. | 177 | 3.46 | 3.51 | 123 | 3.29 | 38 | 3.44 | 16 | 15 | 8.5 | 22 | 12.4 | 51 | 28.8 | 45 | 25.4 | 44 | 24.9 |
| 722 | Remove and install hydraulic relief valves, check valves, bypass valves, and control valves. | 177 | 3.43 | 3.49 | 123 | 3.21 | 38 | 3.50 | 16 | 18 | 10.2 | 23 | 13.0 | 49 | 27.7 | 39 | 22.0 | 48 | 27.1 |
| 723 | Replace and adjust components of hydraulic valves. | 177 | 3.41 | 3.46 | 123 | 3.16 | 38 | 3.63 | 16 | 18 | 10.2 | 28 | 15.8 | 40 | 22.6 | 46 | 26.0 | 45 | 25.4 |
| 724 | Replace and adjust pump wear plates. | 177 | 3.34 | 3.38 | 123 | 3.11 | 38 | 3.56 | 16 | 20 | 11.3 | 27 | 15.3 | 49 | 27.7 | 35 | 19.8 | 46 | 26.0 |
| 725 | Replace cylinder barrels and cylinder rods. | 177 | 3.40 | 3.45 | 123 | 3.16 | 38 | 3.56 | 16 | 20 | 11.3 | 24 | 13.6 | 47 | 26.6 | 38 | 21.5 | 48 | 27.1 |

CURRICULUM CODE NO. & TITLE T-017 Agricultural Science and Mechanization

| Orig. No. | TASKS | Total No. Responses ( ) | MEAN Group | MEAN Emplyr's | ( N ) | MEAN Emplye's | ( N ) | MEAN Educ's | ( N ) | 1 (N) | 1 Pct. | 2 (N) | 2 Pct. | 3 (N) | 3 Pct. | 4 (N) | 4 Pct. | 5 (N) | 5 Pct. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 726 | Replace hydraulic oil filters. | 177 | 3.74 | 3.80 | 123 | 3.45 | 38 | 4.00 | 16 | 9 | 5.1 | 19 | 10.7 | 44 | 24.9 | 42 | 23.7 | 63 | 35.6 |
| 727 | Test valve cartridges for pressure setting. | 175 | 3.44 | 3.47 | 122 | 3.32 | 37 | 3.50 | 16 | 19 | 10.9 | 21 | 12.0 | 48 | 27.4 | 38 | 21.7 | 49 | 28.0 |
| 728 | Adjust regulator air gap. | 124 | 3.19 | 3.09 | 86 | 3.18 | 22 | 3.69 | 16 | 19 | 15.3 | 21 | 16.9 | 29 | 23.4 | 28 | 22.6 | 27 | 21.8 |
| 729 | Check for spark. | 124 | 3.59 | 3.54 | 86 | 3.55 | 22 | 3.94 | 16 | 10 | 8.1 | 15 | 12.1 | 30 | 24.2 | 30 | 24.2 | 39 | 31.1 |
| 730 | Check ignition resistor with ohmmeter. | 124 | 3.42 | 3.34 | 86 | 3.59 | 22 | 3.63 | 16 | 14 | 11.3 | 13 | 10.5 | 35 | 28.2 | 31 | 25.0 | 31 | 25.0 |
| 731 | Check specific gravity of battery. | 123 | 3.14 | 3.05 | 85 | 3.09 | 22 | 3.69 | 16 | 19 | 15.4 | 24 | 19.5 | 31 | 25.2 | 19 | 15.4 | 30 | 24.4 |
| 732 | Check timing. | 124 | 3.85 | 3.91 | 86 | 3.50 | 22 | 4.00 | 16 | 4 | 3.2 | 13 | 10.5 | 30 | 24.2 | 28 | 22.6 | 49 | 39.5 |
| 733 | Clean and inspect distributor cap, rotor, and housing cover. | 123 | 3.85 | 3.84 | 85 | 3.73 | 22 | 4.13 | 16 | 6 | 4.9 | 14 | 11.4 | 25 | 20.3 | 25 | 20.3 | 53 | 43.1 |
| 734 | Clean regulator contact points. | 124 | 3.57 | 3.56 | 86 | 3.32 | 22 | 3.94 | 16 | 12 | 9.7 | 19 | 15.3 | 24 | 19.4 | 25 | 20.2 | 44 | 35.5 |
| 735 | Clean starter drives. | 124 | 3.18 | 3.08 | 86 | 3.18 | 22 | 3.69 | 16 | 21 | 16.9 | 19 | 15.3 | 30 | 24.2 | 25 | 20.2 | 29 | 23.4 |
| 736 | Conduct generator output test for amperage, voltage, and resistance. | 124 | 3.47 | 3.44 | 86 | 3.64 | 22 | 3.38 | 16 | 13 | 10.5 | 22 | 17.7 | 19 | 15.3 | 34 | 27.4 | 36 | 29.0 |
| 737 | Conduct regulator current test. | 124 | 3.17 | 3.14 | 86 | 3.14 | 22 | 3.38 | 16 | 15 | 12.1 | 23 | 18.5 | 35 | 28.2 | 28 | 22.6 | 23 | 18.5 |
| 738 | Conduct regulator voltage test. | 124 | 3.17 | 3.21 | 86 | 2.91 | 22 | 3.31 | 16 | 16 | 12.9 | 19 | 15.3 | 37 | 29.8 | 32 | 25.8 | 20 | 16.1 |
| 739 | Determine purpose of parts in the system. | 124 | 3.60 | 3.61 | 86 | 3.73 | 22 | 3.38 | 16 | 7 | 5.6 | 11 | 8.9 | 38 | 30.6 | 37 | 29.8 | 31 | 25.0 |
| 740 | Identify parts of the system. | 124 | 3.57 | 3.59 | 86 | 3.59 | 22 | 3.38 | 16 | 8 | 6.5 | 12 | 9.7 | 38 | 30.6 | 34 | 27.4 | 32 | 25.8 |
| 741 | Inspect breaker points. | 124 | 3.75 | 3.77 | 86 | 3.55 | 22 | 3.94 | 16 | 7 | 5.6 | 9 | 7.3 | 31 | 25.0 | 38 | 30.6 | 39 | 31.5 |
| 742 | Inspect components of distributor. | 124 | 3.65 | 3.62 | 86 | 3.68 | 22 | 3.75 | 16 | 7 | 5.6 | 12 | 9.7 | 33 | 26.6 | 38 | 30.6 | 34 | 27.4 |
| 743 | Inspect components of starter. | 124 | 3.40 | 3.36 | 86 | 3.41 | 22 | 3.63 | 16 | 9 | 7.3 | 12 | 9.7 | 45 | 36.3 | 36 | 29.0 | 22 | 17.7 |
| 744 | Inspect for poor electrical connections. | 123 | 3.73 | 3.78 | 85 | 3.46 | 22 | 3.88 | 16 | 5 | 4.1 | 15 | 12.2 | 30 | 24.4 | 31 | 25.2 | 42 | 34.1 |
| 745 | Inspect parts of generator. | 124 | 3.39 | 3.34 | 86 | 3.41 | 22 | 3.63 | 16 | 11 | 8.9 | 17 | 13.7 | 37 | 29.8 | 31 | 25.0 | 28 | 22.6 |
| 746 | Inspect the wiring harness for broken wires. | 124 | 3.63 | 3.62 | 86 | 3.50 | 22 | 3.88 | 16 | 7 | 5.6 | 16 | 12.9 | 32 | 25.8 | 30 | 24.2 | 39 | 31.5 |
| 747 | Inspect spark plugs. | 124 | 3.65 | 3.62 | 87 | 3.52 | 21 | 3.94 | 16 | 8 | 6.5 | 17 | 13.7 | 29 | 23.4 | 27 | 21.8 | 43 | 34.7 |
| 748 | Inspect switches. | 124 | 3.46 | 3.39 | 87 | 3.43 | 21 | 3.88 | 16 | 7 | 5.6 | 16 | 12.9 | 42 | 33.9 | 31 | 25.0 | 28 | 22.6 |
| 749 | Install and adjust breaker points. | 124 | 3.81 | 3.82 | 87 | 3.48 | 21 | 4.19 | 16 | 4 | 3.2 | 10 | 8.1 | 37 | 29.8 | 28 | 22.6 | 45 | 36.3 |

URRICULUM CODE NO. & TITLE T-017 Agricultural Science and Mec[illegible]tion

| Orig. No. | TASKS | Total No. Responses ( ) | MEAN |  |  |  |  |  |  | FREQUENCY ( N ) & PCT. OF FREQUENCY (ADJ.) |  |  |  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  |  |  | Group | Emplyr's | ( N ) | Emplye's | ( N ) | Educ's | ( N ) | 1 (N) | 1 Pct. | 2 (N) | 2 Pct. | 3 (N) | 3 Pct. | 4 (N) | 4 Pct. | 5 (N) | 5 Pct. |
| 750 | Install and adjust generator belts. | 124 | 3.74 | 3.78 | 87 | 3.33 | 21 | 4.06 | 16 | 11 | 8.9 | 9 | 7.3 | 31 | 25.0 | 23 | 18.5 | 50 | 40.3 |
| 751 | Install and adjust spark plug. | 124 | 3.77 | 3.84 | 87 | 3.19 | 21 | 4.13 | 16 | 9 | 7.3 | 15 | 12.1 | 27 | 21.8 | 18 | 14.5 | 55 | 44.4 |
| 752 | Install and service battery. | 123 | 3.65 | 3.70 | 87 | 3.14 | 21 | 4.07 | 15 | 10 | 8.1 | 17 | 13.8 | 28 | 22.8 | 19 | 15.4 | 49 | 39.8 |
| 753 | Make no load test on starter. | 123 | 3.00 | 2.91 | 87 | 2.95 | 20 | 3.56 | 16 | 19 | 15.4 | 24 | 19.5 | 35 | 22.5 | 28 | 22.8 | 17 | 13.8 |
| 754 | Polarize the generator. | 123 | 3.18 | 3.05 | 86 | 3.38 | 21 | 3.63 | 16 | 21 | 17.1 | 18 | 14.6 | 25 | 20.3 | 36 | 29.3 | 23 | 18.7 |
| 755 | Read electrical schematic drawings. | 124 | 3.24 | 3.22 | 87 | 3.10 | 21 | 3.56 | 16 | 17 | 13.7 | 25 | 20.2 | 27 | 21.8 | 21 | 16.9 | 34 | 27.4 |
| 756 | Rebuild distributor or replace distributor parts. | 124 | 3.38 | 3.35 | 87 | 3.38 | 21 | 3.56 | 16 | 16 | 12.9 | 15 | 12.1 | 32 | 25.8 | 28 | 22.6 | 33 | 26.6 |
| 757 | Remove and install distributor. | 124 | 3.48 | 3.41 | 87 | 3.62 | 21 | 3.69 | 16 | 14 | 11.3 | 13 | 10.5 | 30 | 24.2 | 33 | 26.6 | 34 | 27.4 |
| 758 | Remove and install generator. | 123 | 3.50 | 3.47 | 86 | 3.38 | 21 | 3.81 | 16 | 11 | 8.9 | 16 | 13.0 | 29 | 23.6 | 35 | 28.5 | 32 | 26.0 |
| 759 | Remove and install voltage regulator. | 124 | 3.47 | 3.45 | 87 | 3.29 | 21 | 3.81 | 16 | 10 | 8.1 | 17 | 13.7 | 33 | 26.6 | 33 | 26.6 | 31 | 25.0 |
| 760 | Remove and install solenoid. | 124 | 3.43 | 3.35 | 87 | 3.48 | 21 | 3.81 | 16 | 7 | 5.6 | 20 | 16.1 | 39 | 31.5 | 29 | 23.4 | 29 | 23.4 |
| 761 | Remove and install starter. | 124 | 3.59 | 3.59 | 87 | 3.33 | 21 | 3.94 | 16 | 8 | 6.5 | 18 | 14.5 | 27 | 21.8 | 35 | 28.2 | 36 | 29.0 |
| 762 | Replace generator bearings. | 123 | 3.40 | 3.29 | 86 | 3.86 | 21 | 3.38 | 16 | 12 | 9.8 | 15 | 12.2 | 34 | 27.6 | 36 | 29.3 | 26 | 21.1 |
| 763 | Replace generator brushes and springs. | 124 | 3.69 | 3.68 | 87 | 3.71 | 21 | 3.69 | 16 | 7 | 5.6 | 10 | 8.1 | 38 | 30.6 | 29 | 23.4 | 40 | 32.3 |
| 764 | Replace spark plug wires. | 124 | 3.72 | 3.75 | 87 | 3.24 | 21 | 4.19 | 16 | 9 | 7.3 | 16 | 12.9 | 28 | 22.6 | 19 | 15.3 | 52 | 41.9 |
| 765 | Replace starter brushes. | 124 | 3.61 | 3.62 | 87 | 3.62 | 21 | 3.56 | 16 | 6 | 4.8 | 14 | 11.3 | 35 | 28.2 | 36 | 29.0 | 33 | 26.6 |
| 766 | Replace starter bushing. | 124 | 3.54 | 3.52 | 87 | 3.71 | 21 | 3.44 | 16 | 7 | 5.6 | 17 | 13.7 | 32 | 25.8 | 38 | 30.6 | 30 | 24.2 |
| 767 | Take voltage drop tests. | 124 | 3.06 | 2.95 | 87 | 3.19 | 21 | 3.44 | 16 | 24 | 19.4 | 19 | 15.3 | 31 | 25.0 | 26 | 21.0 | 24 | 19.4 |
| 768 | Test coil polarity. | 124 | 3.18 | 3.07 | 87 | 3.38 | 21 | 3.50 | 16 | 21 | 16.9 | 13 | 10.5 | 35 | 28.2 | 33 | 26.6 | 22 | 17.7 |
| 769 | Test coil when cold and hot. | 124 | 3.16 | 3.03 | 87 | 3.57 | 21 | 3.31 | 16 | 21 | 16.9 | 19 | 15.3 | 29 | 23.4 | 29 | 23.4 | 26 | 21.0 |
| 770 | Test condensor for resistance, leakage, and capacity. | 124 | 3.11 | 3.05 | 87 | 3.14 | 21 | 3.38 | 16 | 22 | 17.7 | 19 | 15.3 | 31 | 25.0 | 28 | 22.6 | 24 | 19.4 |
| 771 | Test distributor with distributor tester. | 124 | 3.15 | 3.12 | 87 | 3.19 | 21 | 3.31 | 16 | 23 | 18.5 | 19 | 15.3 | 27 | 21.8 | 26 | 21.0 | 29 | 23.4 |
| 772 | Test generator armature for open circuit, ground or short circuit in windings. | 125 | 3.33 | 3.35 | 87 | 3.18 | 22 | 3.44 | 16 | 17 | 13.6 | 19 | 15.2 | 26 | 20.8 | 32 | 25.6 | 31 | 24.8 |

CURRICULUM CODE NO. & TITLE T-017 Agricultural Science and Mechanization

| | TASKS | Total No. Responses ( ) | MEAN Group | Emplyr's | ( N ) | Emplye's | ( N ) | Educ's | ( N ) | FREQUENCY ( N ) & PCT. OF FREQUENCY (ADJ.) 1 (N) | 1 Pct. | 2 (N) | 2 Pct. | 3 (N) | 3 Pct. | 4 (N) | 4 Pct. | 5 (N) | 5 Pct. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 773 | Test generator field coils for grounds or open circuits. | 125 | 3.44 | 3.40 | 87 | 3.64 | 22 | 3.38 | 16 | 13 | 10.4 | 14 | 11.2 | 36 | 28.8 | 29 | 23.2 | 33 | 26.4 |
| 774 | Test ignition system for open circuits, grounds, and resistance with voltmeter. | 125 | 3.39 | 3.39 | 87 | 3.41 | 22 | 3.38 | 16 | 12 | 9.6 | 22 | 17.6 | 25 | 20.0 | 37 | 29.6 | 29 | 23.2 |
| 775 | Test solenoid for resistance and voltage draw. | 125 | 3.16 | 3.13 | 87 | 3.18 | 22 | 3.31 | 16 | 19 | 15.2 | 20 | 16.0 | 33 | 26.4 | 28 | 22.4 | 25 | 20.0 |
| 776 | Test solenoid switch circuit. | 125 | 3.20 | 3.13 | 87 | 3.41 | 22 | 3.31 | 16 | 16 | 12.8 | 22 | 17.6 | 31 | 24.8 | 33 | 26.4 | 23 | 18.4 |
| 777 | Test starter armature and field coils. | 125 | 3.24 | 3.26 | 87 | 3.05 | 22 | 3.38 | 16 | 18 | 14.4 | 17 | 13.6 | 34 | 27.2 | 29 | 23.2 | 27 | 21.6 |
| 778 | Test for oxidized regulator points. | 125 | 3.25 | 3.22 | 87 | 3.23 | 22 | 3.44 | 16 | 18 | 14.4 | 19 | 15.2 | 30 | 24.0 | 30 | 24.0 | 28 | 22.4 |
| 779 | Time ignition system to engine. | 125 | 3.75 | 3.82 | 87 | 3.41 | 22 | 3.88 | 16 | 8 | 6.4 | 12 | 9.6 | 26 | 20.8 | 36 | 28.8 | 43 | 34.4 |
| 780 | Unlock starter. | 125 | 3.55 | 3.52 | 87 | 3.60 | 22 | 3.69 | 16 | 8 | 6.4 | 15 | 12.0 | 34 | 27.2 | 36 | 28.8 | 32 | 25.6 |
| 781 | Use voltmeter to check battery voltage. | 124 | 3.30 | 3.35 | 87 | 2.86 | 21 | 3.63 | 16 | 15 | 12.1 | 12 | 9.7 | 44 | 35.5 | 27 | 21.8 | 26 | 21.0 |
| 782 | Wire the ignition, charging, and starting circuits. | 124 | 3.48 | 3.44 | 86 | 3.64 | 22 | 3.50 | 16 | 14 | 11.3 | 14 | 11.3 | 29 | 23.4 | 32 | 25.8 | 35 | 28.2 |
| 783 | Replace field windings in starter. | 125 | 3.08 | 3.06 | 87 | 3.32 | 22 | 2.88 | 16 | 30 | 24.0 | 22 | 17.6 | 16 | 12.8 | 22 | 17.6 | 35 | 28.0 |
| 784 | Replace ignition switches. | 123 | 3.35 | 3.35 | 85 | 3.14 | 22 | 3.63 | 16 | 16 | 13.0 | 9 | 7.3 | 38 | 30.9 | 36 | 29.3 | 24 | 19.5 |
| 785 | Adjust headlights. | 125 | 3.44 | 3.47 | 87 | 3.05 | 22 | 3.81 | 16 | 8 | 6.4 | 21 | 16.8 | 39 | 31.2 | 22 | 17.6 | 35 | 28.0 |
| 786 | Install wiring harness. | 125 | 3.47 | 3.43 | 87 | 3.50 | 22 | 3.69 | 16 | 13 | 10.4 | 16 | 12.8 | 30 | 24.0 | 31 | 24.8 | 35 | 28.0 |
| 787 | Repair broken electrical wires. | 125 | 3.75 | 3.87 | 87 | 3.18 | 22 | 3.88 | 16 | 4 | 3.2 | 14 | 11.2 | 34 | 27.2 | 30 | 24.0 | 43 | 34.4 |
| 788 | Replace circuit breakers. | 125 | 3.55 | 3.62 | 87 | 3.27 | 22 | 3.56 | 16 | 9 | 7.2 | 15 | 12.0 | 34 | 27.2 | 32 | 25.6 | 35 | 28.0 |
| 789 | Replace fuses. | 125 | 3.66 | 3.74 | 87 | 3.23 | 22 | 3.81 | 16 | 15 | 12.0 | 15 | 12.0 | 21 | 16.8 | 21 | 16.8 | 53 | 42.4 |
| 790 | Replace fuse blocks. | 124 | 3.47 | 3.47 | 86 | 3.59 | 22 | 3.31 | 16 | 13 | 10.5 | 15 | 12.1 | 33 | 26.6 | 27 | 21.8 | 36 | 29.0 |
| 791 | Replace gauges. | 125 | 3.38 | 3.47 | 87 | 2.86 | 22 | 3.56 | 16 | 15 | 12.0 | 14 | 11.2 | 37 | 29.6 | 27 | 21.6 | 32 | 25.6 |
| 792 | Replace lenses. | 125 | 3.32 | 3.36 | 87 | 2.86 | 22 | 3.75 | 16 | 14 | 11.2 | 25 | 20.0 | 33 | 26.4 | 13 | 10.4 | 40 | 32.0 |
| 793 | Replace light bulbs. | 125 | 3.57 | 3.63 | 87 | 3.09 | 22 | 3.88 | 16 | 16 | 12.8 | 17 | 13.6 | 23 | 18.4 | 18 | 14.4 | 51 | 40.8 |
| 794 | Replace speedometer cable and housing. | 124 | 3.27 | 3.24 | 86 | 3.23 | 22 | 3.50 | 16 | 13 | 10.5 | 19 | 15.3 | 42 | 33.9 | 21 | 16.9 | 29 | 23.4 |
| 795 | Replace switches. | 125 | 3.63 | 3.68 | 87 | 3.36 | 22 | 3.75 | 16 | 8 | 6.4 | 13 | 10.4 | 37 | 29.6 | 26 | 20.8 | 41 | 32.8 |
| 796 | Replace warning devices. | 125 | 3.50 | 3.47 | 87 | 3.27 | 22 | 3.94 | 16 | 12 | 9.6 | 11 | 8.8 | 44 | 35.2 | 19 | 15.2 | 39 | 31.2 |

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| Orig. No. | TASKS | Total No. Responses ( ) | MEAN Group | Emplyr's | ( N ) | Emplye's | ( N ) | Educ's | ( N ) | FREQUENCY ( N ) & PCT. OF FREQUENCY (ADJ.) 1 (N) | 1 Pct. | 2 (N) | 2 Pct. | 3 (N) | 3 Pct. | 4 (N) | 4 Pct. | 5 (N) | 5 Pct. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 797 | Test circuits for shorts, grounds, and open circuits. | 125 | 3.77 | 3.82 | 87 | 3.50 | 22 | 3.88 | 16 | 6 | 4.8 | 12 | 9.6 | 29 | 23.2 | 36 | 28.8 | 42 | 33.6 |
| 798 | Test operation of gauges. | 125 | 3.66 | 3.64 | 87 | 3.64 | 22 | 3.75 | 16 | 7 | 5.6 | 13 | 10.4 | 33 | 26.4 | 35 | 28.0 | 37 | 29.6 |
| 799 | Test solenoids. | 121 | 3.54 | 3.59 | 83 | 3.50 | 22 | 3.31 | 16 | 9 | 7.4 | 13 | 10.7 | 36 | 29.8 | 30 | 24.8 | 33 | 27.3 |
| 800 | Adjust valve clearance. | 124 | 3.77 | 3.89 | 87 | 3.32 | 22 | 3.80 | 15 | 5 | 4.0 | 12 | 9.7 | 32 | 25.8 | 32 | 25.8 | 43 | 34.7 |
| 801 | Check compression. | 125 | 3.72 | 3.81 | 87 | 3.41 | 22 | 3.69 | 16 | 6 | 4.8 | 10 | 8.0 | 35 | 28.0 | 36 | 28.8 | 38 | 30.4 |
| 802 | Clean engine and engine parts. | 125 | 3.69 | 3.74 | 87 | 3.27 | 22 | 4.00 | 16 | 7 | 5.6 | 14 | 11.2 | 32 | 25.6 | 30 | 24.0 | 42 | 33.6 |
| 803 | Clean head. | 125 | 3.75 | 3.84 | 87 | 3.41 | 22 | 3.75 | 16 | 6 | 4.8 | 13 | 10.4 | 32 | 25.6 | 29 | 23.2 | 45 | 36.0 |
| 804 | Clean oil and water passages. | 125 | 3.64 | 3.74 | 87 | 3.23 | 22 | 3.69 | 16 | 8 | 6.4 | 13 | 10.4 | 34 | 27.2 | 31 | 24.8 | 39 | 31.2 |
| 805 | Deglaze cylinders. | 125 | 3.47 | 3.44 | 87 | 3.68 | 22 | 3.38 | 16 | 12 | 9.6 | 17 | 13.6 | 29 | 23.2 | 34 | 27.2 | 33 | 26.4 |
| 806 | Determine function of engine parts. | 125 | 3.66 | 3.78 | 87 | 3.59 | 22 | 3.13 | 16 | 7 | 5.6 | 16 | 12.8 | 28 | 22.4 | 35 | 28.0 | 39 | 31.2 |
| 807 | Grind valves. | 125 | 3.52 | 3.56 | 87 | 3.46 | 22 | 3.38 | 16 | 12 | 9.6 | 19 | 15.2 | 28 | 22.4 | 24 | 19.2 | 42 | 33.6 |
| 808 | Identify parts of engine. | 125 | 3.87 | 3.92 | 87 | 3.73 | 22 | 3.81 | 16 | 4 | 3.2 | 9 | 7.2 | 29 | 23.2 | 40 | 32.0 | 43 | 34.4 |
| 809 | Install head gasket. | 125 | 3.80 | 3.85 | 87 | 3.55 | 22 | 3.88 | 16 | 6 | 4.8 | 10 | 8.0 | 30 | 24.0 | 36 | 28.8 | 43 | 34.4 |
| 810 | Install valve guides. | 125 | 3.62 | 3.69 | 87 | 3.18 | 22 | 3.81 | 16 | 10 | 8.0 | 19 | 15.2 | 20 | 16.0 | 36 | 28.8 | 40 | 32.0 |
| 811 | Inspect and measure camshaft bushings. | 125 | 3.41 | 3.45 | 87 | 3.23 | 22 | 3.44 | 16 | 16 | 12.8 | 19 | 15.2 | 25 | 20.0 | 28 | 22.4 | 37 | 29.6 |
| 812 | Inspect and measure valve seats. | 125 | 3.56 | 3.58 | 87 | 3.55 | 22 | 3.50 | 16 | 14 | 11.2 | 12 | 9.6 | 31 | 24.8 | 26 | 20.8 | 42 | 33.6 |
| 813 | Inspect and replace gaskets. | 125 | 3.88 | 3.94 | 87 | 3.50 | 22 | 4.06 | 16 | 3 | 2.4 | 13 | 10.4 | 31 | 24.8 | 27 | 21.6 | 51 | 40.8 |
| 814 | Inspect and replace valve springs. | 125 | 3.58 | 3.54 | 87 | 3.59 | 22 | 3.75 | 16 | 8 | 6.4 | 10 | 8.0 | 39 | 31.2 | 38 | 30.4 | 30 | 24.0 |
| 815 | Inspect camshaft and measure camshaft tolerances. | 125 | 3.42 | 3.48 | 87 | 3.32 | 22 | 3.19 | 16 | 14 | 11.2 | 20 | 16.0 | 26 | 20.8 | 30 | 24.0 | 35 | 28.0 |
| 816 | Inspect camshaft gear. | 125 | 3.42 | 3.40 | 87 | 3.59 | 22 | 3.31 | 16 | 8 | 6.4 | 27 | 21.6 | 25 | 20.0 | 34 | 27.2 | 31 | 24.8 |
| 817 | Inspect components of rocker arm assembly for defects. | 125 | 3.62 | 3.59 | 87 | 3.86 | 22 | 3.44 | 16 | 6 | 4.8 | 18 | 14.4 | 33 | 26.4 | 29 | 23.2 | 39 | 31.2 |
| 818 | Inspect crankshaft and measure tolerances. | 125 | 3.56 | 3.60 | 87 | 3.64 | 22 | 3.25 | 16 | 9 | 7.2 | 21 | 16.8 | 25 | 20.0 | 31 | 24.8 | 39 | 31.2 |
| 819 | Inspect crankshaft gear. | 125 | 3.50 | 3.59 | 87 | 3.32 | 22 | 3.31 | 16 | 10 | 8.0 | 20 | 16.0 | 23 | 18.4 | 41 | 32.8 | 31 | 24.8 |
| 820 | Inspect cylinder and measure cylinder bore. | 125 | 3.50 | 3.61 | 87 | 3.23 | 22 | 3.31 | 16 | 14 | 11.2 | 18 | 14.4 | 22 | 17.6 | 33 | 26.4 | 38 | 30.4 |

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| Orig. No. | TASKS | Total No. Responses ( ) | MEAN | | | | | | FREQUENCY ( N ) & PCT. OF FREQUENCY (ADJ.) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Group | Emplyr's | ( N ) | Emplye's | ( N ) | Educ's | ( N ) | 1 (N) | Pct. | 2 (N) | Pct. | 3 (N) | Pct. | 4 (N) | Pct. | 5 (N) | Pct. |
| 821 | Inspect engine block. | 125 | 3.66 | 3.71 | 87 | 3.50 | 22 | 3.63 | 16 | 8 | 6.4 | 19 | 15.2 | 24 | 19.2 | 30 | 24.0 | 44 | 35.2 |
| 822 | Inspect flywheel. | 125 | 3.66 | 3.72 | 87 | 3.50 | 22 | 3.56 | 16 | 5 | 4.0 | 18 | 14.4 | 33 | 26.4 | 27 | 21.6 | 42 | 33.6 |
| 823 | Inspect head and head gasket. | 125 | 3.82 | 3.87 | 87 | 3.68 | 22 | 3.75 | 16 | 5 | 4.0 | 8 | 6.4 | 34 | 27.2 | 35 | 28.0 | 43 | 34.4 |
| 824 | Inspect main bearings and measure main bearing clearance. | 124 | 3.50 | 3.58 | 86 | 3.36 | 22 | 3.25 | 16 | 13 | 10.5 | 22 | 17.7 | 21 | 16.9 | 26 | 21.0 | 42 | 33.9 |
| 825 | Inspect connecting rods and measure rod bearing clearance. | 125 | 3.65 | 3.72 | 87 | 3.59 | 22 | 3.31 | 16 | 11 | 8.8 | 17 | 13.6 | 22 | 17.6 | 30 | 24.0 | 45 | 36.0 |
| 826 | Inspect pistons and measure piston tolerances. | 125 | 3.57 | 3.60 | 87 | 3.59 | 22 | 3.38 | 16 | 12 | 9.6 | 21 | 16.8 | 21 | 16.8 | 26 | 20.8 | 45 | 36.0 |
| 827 | Inspect piston pins and measure pin tolerances. | 125 | 3.42 | 3.43 | 87 | 3.46 | 22 | 3.31 | 16 | 15 | 12.0 | 23 | 18.4 | 20 | 16.0 | 29 | 23.2 | 38 | 30.4 |
| 828 | Inspect piston rings and measure piston ring tolerances. | 124 | 3.52 | 3.51 | 86 | 3.64 | 22 | 3.38 | 16 | 13 | 10.5 | 18 | 14.5 | 24 | 19.4 | 30 | 24.2 | 39 | 31.5 |
| 829 | Inspect ring gear. | 125 | 3.41 | 3.32 | 87 | 3.73 | 22 | 3.44 | 16 | 16 | 12.8 | 20 | 16.0 | 21 | 16.8 | 33 | 26.4 | 35 | 28.0 |
| 830 | Lap valves. | 125 | 3.10 | 3.00 | 87 | 3.27 | 22 | 3.38 | 16 | 26 | 20.8 | 17 | 13.6 | 27 | 21.6 | 29 | 23.2 | 26 | 20.8 |
| 831 | Measure camshaft end play. | 125 | 3.39 | 3.40 | 87 | 3.41 | 22 | 3.31 | 16 | 11 | 8.8 | 27 | 21.6 | 21 | 16.8 | 34 | 27.2 | 32 | 25.6 |
| 832 | Measure crankshaft end play. | 125 | 3.39 | 3.38 | 87 | 3.50 | 22 | 3.31 | 16 | 12 | 9.6 | 24 | 19.2 | 26 | 20.8 | 29 | 23.2 | 34 | 27.2 |
| 833 | Measure oil slinger run-out. | 125 | 3.32 | 3.35 | 87 | 3.23 | 22 | 3.31 | 16 | 17 | 13.6 | 19 | 15.2 | 27 | 21.6 | 31 | 24.8 | 31 | 24.8 |
| 834 | Measure valve guide tolerances. | 125 | 3.32 | 3.37 | 87 | 3.18 | 22 | 3.25 | 16 | 17 | 13.6 | 18 | 14.4 | 29 | 23.2 | 30 | 24.0 | 31 | 24.8 |
| 835 | Rebore cylinders. | 124 | 3.28 | 3.27 | 86 | 3.64 | 22 | 2.88 | 16 | 21 | 16.9 | 21 | 16.9 | 23 | 18.5 | 20 | 16.1 | 39 | 31.5 |
| 836 | Reface valve seats. | 124 | 3.48 | 3.56 | 86 | 3.50 | 22 | 3.00 | 16 | 13 | 10.5 | 22 | 17.7 | 26 | 21.0 | 19 | 15.3 | 44 | 35.5 |
| 837 | Remove and install camshaft. | 124 | 3.36 | 3.40 | 86 | 3.27 | 22 | 3.31 | 16 | 15 | 12.1 | 23 | 18.5 | 20 | 16.1 | 34 | 27.4 | 32 | 25.8 |
| 838 | Remove and install camshaft bushings. | 125 | 3.46 | 3.51 | 87 | 3.46 | 22 | 3.19 | 16 | 11 | 8.8 | 22 | 17.6 | 26 | 20.8 | 31 | 24.8 | 35 | 28.0 |
| 839 | Remove and install camshaft gear. | 125 | 3.47 | 3.55 | 87 | 3.36 | 22 | 3.19 | 16 | 10 | 8.0 | 21 | 16.8 | 27 | 21.6 | 34 | 27.2 | 33 | 26.4 |
| 840 | Remove and install crankshaft. | 125 | 3.46 | 3.39 | 87 | 3.41 | 22 | 3.31 | 16 | 13 | 10.4 | 21 | 16.8 | 28 | 22.4 | 31 | 24.8 | 32 | 25.6 |
| 841 | Remove and install crankshaft gear. | 125 | 3.46 | 3.45 | 87 | 3.68 | 22 | 3.19 | 16 | 9 | 7.2 | 26 | 20.8 | 23 | 18.4 | 33 | 26.4 | 34 | 27.2 |
| 842 | Remove and install cylinder liners. | 125 | 3.45 | 3.46 | 87 | 3.55 | 22 | 3.25 | 16 | 14 | 11.2 | 23 | 18.4 | 18 | 14.4 | 33 | 26.4 | 37 | 29.6 |
| 843 | Remove and install engine. | 125 | 3.74 | 3.81 | 87 | 3.77 | 22 | 3.38 | 16 | 9 | 7.2 | 11 | 8.8 | 28 | 22.4 | 32 | 25.6 | 45 | 36.0 |
| 844 | Remove and install front and rear oil seals. | 125 | 3.72 | 3.83 | 87 | 3.59 | 22 | 3.31 | 16 | 7 | 5.6 | 17 | 13.6 | 25 | 20.0 | 31 | 24.8 | 45 | 36.0 |

Appendix

RRICULUM CODE NO. & TITLE T-017 Agricultural Science and Me ation

| Orig. No. | TASKS | Total No. Responses ( ) | MEAN | | | | | | | FREQUENCY ( N ) & PCT. OF FREQUENCY (ADJ.) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Group | Emplyr's | ( N ) | Emplye's | ( N ) | Educ's | ( N ) | 1 (N) | 1 Pct. | 2 (N) | 2 Pct. | 3 (N) | 3 Pct. | 4 (N) | 4 Pct. | 5 (N) | 5 Pct. |
| 845 | Remove and install head. | 125 | 3.67 | 3.67 | 87 | 3.96 | 22 | 3.31 | 16 | 8 | 6.4 | 17 | 13.6 | 25 | 20.0 | 33 | 26.4 | 42 | 33.6 |
| 846 | Remove and install piston assembly. | 124 | 3.81 | 3.67 | 87 | 3.59 | 22 | 3.31 | 16 | 10 | 8.1 | 17 | 13.7 | 25 | 20.2 | 31 | 25.0 | 41 | 33.1 |
| 847 | Remove and install piston rings. | 125 | 3.62 | 3.69 | 87 | 3.59 | 22 | 3.25 | 16 | 12 | 9.6 | 15 | 12.0 | 23 | 18.4 | 34 | 27.2 | 41 | 32.8 |
| 848 | Remove and install piston pins. | 125 | 3.62 | 3.72 | 87 | 3.46 | 22 | 3.31 | 16 | 10 | 8.0 | 21 | 16.8 | 20 | 16.0 | 29 | 23.2 | 45 | 36.0 |
| 849 | Remove and install oil pan. | 125 | 3.54 | 3.52 | 87 | 3.59 | 22 | 3.56 | 16 | 8 | 6.4 | 19 | 15.2 | 34 | 27.2 | 26 | 20.8 | 38 | 30.4 |
| 850 | Remove and install valves. | 125 | 3.54 | 3.62 | 87 | 3.36 | 22 | 3.31 | 16 | 12 | 9.6 | 15 | 12.0 | 34 | 27.2 | 22 | 17.6 | 42 | 33.6 |
| 851 | Remove and install valve seat inserts. | 125 | 3.46 | 3.51 | 87 | 3.36 | 22 | 3.31 | 16 | 12 | 9.6 | 21 | 16.8 | 27 | 21.6 | 28 | 22.4 | 37 | 29.6 |
| 852 | Remove and install rocker arm assembly. | 124 | 3.55 | 3.56 | 86 | 3.73 | 22 | 3.25 | 16 | 11 | 8.9 | 18 | 14.5 | 24 | 19.4 | 34 | 27.4 | 37 | 29.8 |
| 853 | Remove and install rocker arm cover. | 125 | 3.48 | 3.51 | 87 | 3.64 | 22 | 3.13 | 16 | 14 | 11.2 | 15 | 12.0 | 29 | 23.2 | 31 | 24.8 | 36 | 28.8 |
| 854 | Remove and install timing chain. | 125 | 3.70 | 3.78 | 87 | 3.59 | 22 | 3.38 | 16 | 7 | 5.6 | 15 | 12.0 | 29 | 23.2 | 32 | 25.6 | 42 | 33.6 |
| 855 | Remove and install oil slinger. | 125 | 3.24 | 3.41 | 87 | 3.55 | 22 | 3.31 | 16 | 12 | 9.6 | 19 | 15.2 | 30 | 24.0 | 32 | 25.6 | 32 | 25.6 |
| 856 | Remove and install rod bearing inserts. | 125 | 3.66 | 3.75 | 87 | 3.64 | 22 | 3.25 | 16 | 11 | 8.8 | 15 | 12.0 | 26 | 20.8 | 26 | 20.8 | 47 | 37.6 |
| 857 | Remove cylinder ridge. | 125 | 3.61 | 3.62 | 87 | 3.82 | 22 | 3.25 | 16 | 9 | 7.2 | 17 | 13.6 | 28 | 22.4 | 31 | 24.8 | 40 | 32.0 |
| 858 | Remove or add shims. | 125 | 3.49 | 3.51 | 87 | 3.59 | 22 | 3.25 | 16 | 12 | 9.6 | 19 | 15.2 | 30 | 24.0 | 24 | 19.2 | 40 | 32.0 |
| 859 | Remove and replace main bearings. | 125 | 3.68 | 3.77 | 87 | 3.64 | 22 | 3.25 | 16 | 11 | 8.8 | 14 | 11.2 | 28 | 22.4 | 23 | 18.4 | 49 | 39.2 |
| 860 | Remove and replace flywheel. | 125 | 3.46 | 3.41 | 87 | 3.73 | 22 | 3.38 | 16 | 14 | 11.2 | 13 | 10.4 | 33 | 26.4 | 31 | 24.8 | 34 | 27.8 |
| 861 | Remove and replace ring gear. | 125 | 3.39 | 4.41 | 87 | 3.36 | 22 | 3.31 | 16 | 14 | 11.2 | 20 | 16.0 | 28 | 22.4 | 29 | 23.2 | 34 | 27.2 |
| 862 | Replace piston pin bushings. | 125 | 3.50 | 3.56 | 87 | 3.41 | 22 | 3.25 | 16 | 12 | 9.6 | 17 | 13.6 | 27 | 21.6 | 35 | 28.0 | 34 | 27.2 |
| 863 | Separate and rejoin tractor. | 124 | 3.72 | 3.90 | 86 | 3.27 | 22 | 3.38 | 16 | 9 | 7.3 | 14 | 11.3 | 27 | 21.8 | 27 | 21.8 | 47 | 37.9 |
| 864 | Torque rod bearing caps. | 124 | 3.61 | 3.76 | 86 | 3.27 | 22 | 3.25 | 16 | 12 | 9,7 | 19 | 15.3 | 17 | 13.7 | 34 | 27.4 | 42 | 33.9 |
| 865 | Torque main bearings. | 124 | 3.65 | 3.78 | 86 | 3.41 | 22 | 3.25 | 16 | 14 | 11.3 | 13 | 10.5 | 19 | 15.3 | 35 | 28.2 | 43 | 34.7 |
| 866 | Torque head bolts. | 123 | 3.70 | 3.85 | 86 | 3.50 | 22 | 3.13 | 15 | 8 | 6.5 | 14 | 11.4 | 27 | 22.0 | 32 | 26.0 | 42 | 34.1 |
| 867 | Time valve assembly. | 120 | 3.66 | 3.75 | 84 | 3.62 | 21 | 3.20 | 15 | 10 | 8.3 | 12 | 10.0 | 23 | 19.2 | 39 | 32.5 | 36 | 30.0 |
| 868 | Adjust for proper engine speed. | 124 | 3.67 | 3.77 | 86 | 3.55 | 22 | 3.31 | 16 | 7 | 5.6 | 12 | 9.7 | 34 | 27.4 | 33 | 26.6 | 38 | 30.6 |

Appendix

CURRICULUM CODE NO. & TITLE T-017 Agricultural Science and Mechanization

| Orig. No. | TASKS | Total No. Responses ( ) | MEAN |  |  |  |  |  |  | FREQUENCY ( N ) & PCT. OF FREQUENCY (ADJ.) |  |  |  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  |  |  | Group | Emplyr's | ( N ) | Emplye's | ( N ) | Educ's | ( N ) | 1 (N) | 1 Pct. | 2 (N) | 2 Pct. | 3 (N) | 3 Pct. | 4 (N) | 4 Pct. | 5 (N) | 5 Pct. |
| 869 | Inspect components of governor. | 124 | 3.56 | 3.61 | 86 | 3.59 | 22 | 3.25 | 16 | 6 | 4.8 | 19 | 15.3 | 32 | 25.8 | 34 | 27.4 | 33 | 26.6 |
| 870 | Inspect components of ventilator pump. | 124 | 3.32 | 3.28 | 86 | 3.55 | 22 | 3.25 | 16 | 8 | 6.5 | 32 | 25.8 | 24 | 19.4 | 32 | 25.8 | 28 | 22.6 |
| 871 | Measure idler gear end play. | 124 | 3.36 | 3.34 | 86 | 3.59 | 22 | 3.13 | 16 | 15 | 12.1 | 20 | 16.1 | 23 | 18.5 | 38 | 30.6 | 28 | 22.6 |
| 872 | Remove and install governor and/or ventilator pump. | 124 | 3.36 | 3.38 | 86 | 3.36 | 22 | 3.25 | 16 | 13 | 10.5 | 21 | 16.9 | 27 | 21.8 | 34 | 27.4 | 29 | 23.4 |
| 873 | Remove and install governor needle bearings. | 124 | 3.30 | 3.30 | 86 | 3.36 | 22 | 3.19 | 16 | 18 | 14.5 | 15 | 12.1 | 31 | 25.0 | 32 | 25.8 | 28 | 22.6 |
| 874 | Remove and install ventilator pump idler gear assembly. | 123 | 3.25 | 3.26 | 86 | 3.36 | 22 | 3.07 | 15 | 16 | 13.0 | 23 | 18.7 | 24 | 19.5 | 34 | 27.6 | 26 | 21.1 |
| 875 | Replace governor thrust bearings and weights. | 119 | 3.29 | 3.29 | 84 | 3.43 | 21 | 3.07 | 14 | 19 | 16.0 | 15 | 12.6 | 25 | 21.0 | 33 | 27.7 | 27 | 22.7 |
| 876 | Add oil to engines. | 124 | 3.68 | 3.73 | 86 | 3.18 | 22 | 4.06 | 16 | 19 | 15.3 | 16 | 12.9 | 14 | 11.3 | 12 | 9.7 | 63 | 50.8 |
| 877 | Change oil and oil filters. | 124 | 3.78 | 3.86 | 86 | 3.18 | 22 | 4.19 | 16 | 13 | 10.5 | 17 | 13.7 | 15 | 12.1 | 18 | 14.5 | 61 | 49.2 |
| 878 | Check and adjust oil pressure. | 124 | 3.82 | 3.93 | 86 | 3.27 | 22 | 3.94 | 16 | 8 | 6.5 | 7 | 5.6 | 33 | 26.6 | 28 | 22.6 | 48 | 38.7 |
| 879 | Clean diesel engine oil cooler. | 124 | 3.59 | 3.70 | 86 | 3.23 | 22 | 3.50 | 16 | 10 | 8.1 | 16 | 12.9 | 30 | 24.2 | 27 | 21.8 | 41 | 33.1 |
| 880 | Inspect components of oil pump. | 124 | 3.59 | 3.66 | 86 | 3.55 | 22 | 3.2516 | 16 | 9 | 7.3 | 10 | 8.1 | 34 | 27.4 | 41 | 33.1 | 30 | 24.2 |
| 881 | Remove and install diesel engine oil cooler. | 124 | 3.44 | 3.54 | 86 | 3.14 | 22 | 3.31 | 16 | 12 | 9.7 | 17 | 13.7 | 33 | 26.6 | 29 | 23.4 | 33 | 26.6 |
| 882 | Remove and install oil pump. | 121 | 3.53 | 3.62 | 85 | 3.36 | 22 | 3.21 | 14 | 9 | 7.4 | 12 | 9.9 | 38 | 31.4 | 30 | 24.8 | 32 | 26.4 |
| 883 | Replace drive gear and shaft. | 123 | 3.37 | 3.38 | 86 | 3.46 | 22 | 3.20 | 15 | 12 | 9.8 | 20 | 16.3 | 28 | 22.8 | 36 | 29.3 | 27 | 22.0 |
| 884 | Replace idler gear. | 120 | 3.44 | 3.39 | 84 | 3.67 | 21 | 3.40 | 15 | 11 | 99.2 | 16 | 13.3 | 29 | 24.2 | 37 | 30.8 | 37 | 22.5 |
| 885 | Add coolant to system. | 124 | 3.72 | 3.79 | 86 | 3.23 | 22 | 4.00 | 16 | 17 | 13.7 | 14 | 11.3 | 17 | 13.7 | 15 | 12.6 | 61 | 49.2 |
| 886 | Back flush cooling system. | 124 | 3.61 | 3.62 | 86 | 3.36 | 22 | 3.94 | 16 | 14 | 11.3 | 12 | 9.7 | 28 | 22.6 | 24 | 19.4 | 46 | 37.1 |
| 887 | Clean cooling system with commercial cleaners. | 124 | 3.52 | 3.50 | 86 | 3.32 | 22 | 3.94 | 16 | 11 | 8.9 | 12 | 9.7 | 43 | 34.7 | 17 | 13.7 | 41 | 33.1 |
| 888 | Inspect and test system for leaks. | 124 | 3.73 | 3.73 | 86 | 3.55 | 22 | 3.94 | 16 | 7 | 5.6 | 13 | 10.5 | 31 | 25.0 | 29 | 23.4 | 44 | 35.5 |
| 889 | Inspect components of water pump. | 124 | 3.62 | 3.63 | 86 | 3.59 | 22 | 3.63 | 16 | 9 | 7.3 | 9 | 7.3 | 37 | 29.8 | 34 | 27.4 | 35 | 28.2 |
| 890 | Install and adjust fan belt. | 124 | 3.78 | 3.84 | 86 | 3.41 | 22 | 4.00 | 16 | 8 | 6.5 | 14 | 11.3 | 27 | 21.8 | 23 | 18.5 | 52 | 41.9 |
| 891 | Remove and install fan. | 124 | 3.44 | 3.30 | 86 | 3.64 | 22 | 3.94 | 16 | 15 | 12.1 | 11 | 8.9 | 37 | 29.8 | 26 | 21.0 | 35 | 28.2 |
| 892 | Remove and install radiator. | 123 | 3.52 | 3.40 | 85 | 3.64 | 22 | 4.00 | 16 | 13 | 10.6 | 10 | 8.1 | 39 | 31.7 | 22 | 17.9 | 39 | 31.7 |

RRICULUM CODE NO. & TITLE T-017 Agricultural Science and Mec tion

| Orig. No. | TASKS | Total No. Responses ( ) | MEAN Group | Emplyr's | ( N ) | Emplye's | ( N ) | Educ's | ( N ) | FREQUENCY ( N ) & PCT. OF FREQUENCY (ADJ.) 1 (N) | 1 Pct. | 2 (N) | 2 Pct. | 3 (N) | 3 Pct. | 4 (N) | 4 Pct. | 5 (N) | 5 Pct. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 893 | Remove and install thermostats. | 124 | 3.65 | 3.64 | 86 | 3.50 | 22 | 3.94 | 16 | 12 | 9.7 | 10 | 8.1 | 29 | 23.4 | 31 | 25.0 | 42 | 33.9 |
| 894 | Remove and install water pump. | 124 | 3.58 | 3.55 | 86 | 3.50 | 22 | 3.88 | 16 | 10 | 8.1 | 9 | 7.3 | 43 | 34.7 | 23 | 18.5 | 39 | 31.5 |
| 895 | Replace water pump impeller. | 123 | 3.43 | 3.44 | 86 | 3.50 | 22 | 3.27 | 15 | 13 | 10.6 | 10 | 8.1 | 36 | 29.3 | 39 | 31.7 | 25 | 20.3 |
| 896 | Replace water pump seal and bearing. | 123 | 3.43 | 3.52 | 86 | 3.18 | 22 | 3.27 | 15 | 12 | 9.8 | 14 | 11.4 | 35 | 28.5 | 33 | 26.8 | 29 | 23.6 |
| 897 | Replace radiator hoses. | 124 | 3.69 | 3.77 | 86 | 3.36 | 22 | 3.69 | 16 | 11 | 8.9 | 14 | 11.3 | 29 | 23.4 | 19 | 15.3 | 51 | 41.1 |
| 898 | Test thermostats. | 118 | 3.74 | .372 | 83 | 3.70 | 20 | 3.87 | 15 | 7 | 5.9 | 9 | 7.6 | 31 | 26.3 | 32 | 27.1 | 39 | 33.1 |
| 899 | Adjust carburetors. | 123 | 4.00 | 4.06 | 85 | 3.73 | 22 | 4.06 | 16 | 3 | 2.4 | 8 | 6.5 | 27 | 22.0 | 33 | 26.8 | 52 | 42.3 |
| 900 | Bleed fuel system. | 123 | 3.74 | 3.84 | 85 | 3.23 | 22 | 3.94 | 16 | 6 | 4.9 | 8 | 6.5 | 39 | 31.7 | 29 | 23.6 | 41 | 33.3 |
| 901 | Clean carburetor. | 123 | 3.85 | 3.85 | 85 | 3.73 | 22 | 4.00 | 16 | 5 | 4.1 | 8 | 6.5 | 28 | 22.8 | 42 | 34.1 | 40 | 32.5 |
| 902 | Clean sediment bowl and screen. | 123 | 3.69 | 3.72 | 85 | 3.50 | 22 | 3.81 | 16 | 9 | 7.3 | 11 | 8.9 | 36 | 29.3 | 20 | 16.3 | 47 | 38.2 |
| 903 | Determine purpose of various parts. | 123 | 3.65 | 3.65 | 85 | 3.59 | 22 | 3.75 | 16 | 5 | 4.1 | 9 | 7.3 | 40 | 32.5 | 39 | 31.7 | 30 | 24.4 |
| 904 | Identify parts of fuel system. | 123 | 3.65 | 3.67 | 85 | 3.59 | 22 | 3.63 | 16 | 4 | 3.3 | 10 | 8.1 | 43 | 35.0 | 34 | 27.6 | 32 | 26.0 |
| 905 | Inspect carburetor parts for defects. | 123 | 3.66 | 3.67 | 85 | 3.59 | 22 | 3.69 | 16 | 7 | 5.7 | 10 | 8.1 | 35 | 28.5 | 37 | 30.1 | 34 | 27.6 |
| 906 | Inspect manifolds. | 123 | 3.42 | 3.41 | 85 | 3.36 | 22 | 3.56 | 16 | 6 | 4.9 | 14 | 11.4 | 48 | 39.0 | 32 | 26.0 | 23 | 18.7 |
| 907 | Install carburetor repair kit. | 123 | 3.63 | 3.57 | 85 | 3.96 | 22 | 3.50 | 16 | 7 | 5.7 | 15 | 12.2 | 28 | 22.8 | 40 | 32.5 | 33 | 26.8 |
| 908 | Remove and install diesel fuel pump. | 123 | 3.50 | 3.48 | 85 | 3.59 | 22 | 3.50 | 16 | 13 | 10.6 | 10 | 8.1 | 35 | 28.5 | 32 | 26.0 | 33 | 26.8 |
| 909 | Remove and install fuel tank. | 123 | 3.15 | 3.14 | 85 | 3.18 | 22 | 3.19 | 16 | 20 | 16.3 | 11 | 8.9 | 44 | 35.8 | 26 | 21.1 | 22 | 17.9 |
| 910 | Remove and install gas fuel pump. | 123 | 3.42 | 3.37 | 85 | 3.55 | 22 | 3.56 | 16 | 12 | 9.8 | 17 | 13.8 | 34 | 27.6 | 27 | 22.0 | 33 | 26.8 |
| 911 | Remove and install manifolds. | 123 | 3.20 | 3.15 | 85 | 3.32 | 22 | 3.25 | 16 | 15 | 12.2 | 18 | 14.6 | 38 | 30.9 | 32 | 26.0 | 20 | 16.3 |
| 912 | Remove and install injection nozzles. | 123 | 3.47 | 3.54 | 85 | 3.46 | 22 | 3.13 | 16 | 12 | 9.8 | 15 | 12.2 | 35 | 28.5 | 25 | 20.3 | 36 | 29.3 |
| 913 | Repair injection nozzles. | 123 | 3.40 | 3.44 | 85 | 3.46 | 22 | 3.13 | 16 | 20 | 16.3 | 10 | 8.1 | 34 | 27.6 | 19 | 15.4 | 40 | 32.5 |
| 914 | Replace fuel filters. | 123 | 3.73 | 3.87 | 85 | 3.14 | 22 | 3.81 | 16 | 9 | 7.3 | 10 | 8.1 | 33 | 26.8 | 24 | 19.5 | 47 | 38.2 |
| 915 | Replace fuel lines. | 123 | 3.52 | 3.46 | 85 | 3.68 | 22 | 3.63 | 16 | 11 | 8.9 | 9 | 7.3 | 44 | 35.8 | 23 | 18.7 | 36 | 29.3 |
| 916 | Replace fuel system warning devices. | 123 | 3.45 | 3.45 | 85 | 3.59 | 22 | 3.25 | 16 | 10 | 8.1 | 13 | 10.6 | 41 | 33.3 | 30 | 24.4 | 29 | 23.6 |
| 917 | Replace needle bearings. | 123 | 3.38 | 3.34 | 85 | 3.55 | 22 | 3.38 | 16 | 11 | 8.9 | 14 | 11.4 | 43 | 35.0 | 27 | 22.0 | 28 | 22.8 |
| 918 | Run manifold vacuum test. | 123 | 3.20 | 3.24 | 85 | 2.82 | 22 | 3.50 | 16 | 16 | 13.0 | 20 | 16.3 | 37 | 30.1 | 24 | 19.5 | 26 | 21.1 |

CURRICULUM CODE NO. & TITLE T-017 Agricultural Science and Mechanization

| Orig. No. | TASKS | Total No. Responses ( ) | MEAN Group | Emplyr's | ( N ) | Emplye's | ( N ) | Educ's | ( N ) | FREQUENCY ( N ) & PCT. OF FREQUENCY (ADJ.) 1 (N) | 1 Pct. | 2 (N) | 2 Pct. | 3 (N) | 3 Pct. | 4 (N) | 4 Pct. | 5 (N) | 5 Pct. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 919 | Service air cleaner. | 123 | 3.80 | 3.80 | 85 | 3.64 | 22 | 4.00 | 16 | 10 | 8.1 | 12 | 9.8 | 25 | 20.3 | 22 | 17.9 | 54 | 43.9 |
| 920 | Test diesel fuel injection pump. | 122 | 3.46 | 3.39 | 85 | 3.96 | 22 | 3.13 | 15 | 12 | 9.8 | 15 | 12.3 | 34 | 27.9 | 27 | 22.1 | 34 | 27.9 |
| 921 | Test fuel pump. | 123 | 3.50 | 3.49 | 86 | 3.77 | 22 | 3.20 | 15 | 9 | 7.3 | 13 | 10.6 | 40 | 32.5 | 29 | 23.6 | 32 | 26.0 |
| 922 | Test injection nozzles. | 124 | 3.43 | 3.35 | 86 | 3.91 | 22 | 3.19 | 16 | 15 | 12.1 | 12 | 9.7 | 37 | 29.8 | 25 | 20.2 | 35 | 28.2 |
| 923 | Time injection pump. | 118 | 3.40 | 3.42 | 83 | 3.40 | 20 | 3.27 | 15 | 17 | 14.4 | 10 | 8.5 | 34 | 28.8 | 23 | 19.5 | 34 | 28.8 |
| 924 | Identify breeds. | 123 | 3.48 | 3.35 | 86 | 3.77 | 22 | 3.80 | 15 | 12 | 9.8 | 13 | 10.6 | 37 | 30.1 | 26 | 21.1 | 35 | 28.5 |
| 925 | Evaluate advantages and disadvantages of different breeds. | 123 | 3.63 | 3.56 | 86 | 3.82 | 22 | 3.80 | 15 | 9 | 7.3 | 8 | 6.5 | 39 | 31.7 | 30 | 24.4 | 37 | 30.1 |
| 926 | Determine factors for meat production. | 124 | 3.66 | 3.57 | 86 | 3.91 | 22 | 3.81 | 16 | 9 | 7.3 | 9 | 7.3 | 36 | 29.0 | 31 | 25.0 | 39 | 31.5 |
| 927 | Determine factors for egg production. | 117 | 3.70 | 3.60 | 82 | 3.95 | 20 | 3.93 | 15 | 7 | 6.0 | 11 | 9.4 | 30 | 25.6 | 31 | 26.5 | 38 | 32.5 |
| 928 | Determine brooder house space requirements. | 124 | 3.58 | 3.48 | 86 | 3.77 | 22 | 3.88 | 16 | 12 | 9.7 | 10 | 8.1 | 31 | 25.0 | 36 | 29.0 | 35 | 28.2 |
| 929 | Provide appropriate temperature and ventilation. | 124 | 3.69 | 3.63 | 86 | 3.91 | 22 | 3.75 | 16 | 10 | 8.1 | 10 | 8.1 | 26 | 21.0 | 40 | 32.3 | 38 | 30.6 |
| 930 | Determine feed and water requirements. | 124 | 3.77 | 3.67 | 86 | 4.05 | 22 | 3.88 | 16 | 9 | 7.3 | 10 | 8.1 | 25 | 20.2 | 37 | 29.8 | 43 | 34.7 |
| 931 | Determine amount of lighting needed. | 122 | 3.68 | 3.60 | 85 | 3.91 | 22 | 3.80 | 15 | 10 | 8.2 | 8 | 6.6 | 31 | 25.4 | 35 | 28.7 | 38 | 31.1 |
| 932 | Maintain proper bedding. | 123 | 3.61 | 3.56 | 86 | 3.68 | 22 | 3.80 | 15 | 11 | 8.9 | 9 | 7.3 | 32 | 26.0 | 36 | 29.3 | 35 | 28.5 |
| 933 | Vaccinate chicks. | 124 | 3.57 | 3.54 | 86 | 3.64 | 22 | 3.69 | 16 | 13 | 10.5 | 8 | 6.5 | 33 | 26.6 | 35 | 28.2 | 35 | 28.2 |
| 934 | Debeak and sex chicks. | 117 | 3.52 | 3.46 | 83 | 3.60 | 20 | 3.79 | 14 | 13 | 11.1 | 13 | 11.1 | 27 | 23.1 | 28 | 23.9 | 36 | 30.8 |
| 935 | Determine broiler house space requirements. | 124 | 3.55 | 3.50 | 86 | 3.68 | 22 | 3.63 | 16 | 15 | 12.1 | 11 | 8.9 | 27 | 21.8 | 33 | 26.6 | 38 | 30.6 |
| 936 | Determine amount of lighting needed. | 124 | 3.63 | 3.55 | 86 | 3.77 | 22 | 3.88 | 16 | 13 | 10.5 | 6 | 4.8 | 32 | 25.8 | 36 | 29.0 | 37 | 29.8 |
| 937 | Provide appropriate temperature and ventilation. | 123 | 3.67 | 3.64 | 85 | 3.68 | 22 | 3.81 | 16 | 13 | 10.6 | 9 | 7.3 | 27 | 22.0 | 31 | 25.2 | 43 | 35.0 |
| 938 | Provide appropriate feeders and drinkers and properly maintain them. | 122 | 3.66 | 3.66 | 84 | 3.73 | 22 | 3.63 | 16 | 13 | 10.7 | 6 | 4.9 | 28 | 23.0 | 37 | 30.3 | 38 | 31.1 |
| 939 | Determine feed requirements for different weight and age of broilers. | 124 | 3.66 | 3.66 | 86 | 3.68 | 22 | 3.63 | 16 | 11 | 8.9 | 9 | 7.3 | 32 | 25.8 | 31 | 25.0 | 41 | 33.1 |
| 940 | Provide routine medication and parasite control. | 124 | 3.61 | 3.58 | 86 | 3.64 | 22 | 3.69 | 16 | 11 | 8.9 | 13 | 10.5 | 30 | 24.2 | 30 | 24.2 | 40 | 32.3 |
| 941 | Keep feed consumption and growth records. | 124 | 3.56 | 3.47 | 86 | 3.68 | 22 | 3.88 | 16 | 11 | 8.9 | 10 | 8.1 | 34 | 27.4 | 37 | 29.8 | 32 | 25.8 |

URRICULUM CODE NO. & TITLE T-017 Agricultural Science and Mech tion

| Orig. No. | TASKS | Total No. Responses ( ) | MEAN Group | Emplyr's | ( N ) | Emplye's | ( N ) | Educ's | ( N ) | FREQUENCY ( N ) & PCT. OF FREQUENCY (ADJ.) 1 (N) | 1 Pct. | 2 (N) | 2 Pct. | 3 (N) | 3 Pct. | 4 (N) | 4 Pct. | 5 (N) | 5 Pct. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 942 | Maintain proper bedding. | 123 | 3.54 | 3.48 | 85 | 3.64 | 22 | 3.69 | 16 | 11 | 8.9 | 10 | 8.1 | 36 | 29.3 | 34 | 27.6 | 32 | 26.0 |
| 943 | Dispose of diseased birds properly. | 124 | 3.64 | 3.59 | 86 | 3.64 | 22 | 3.88 | 16 | 12 | 9.7 | 9 | 7.3 | 34 | 27.4 | 26 | 21.0 | 43 | 34.7 |
| 944 | Properly water and feed flock. | 124 | 3.62 | 3.64 | 86 | 3.41 | 22 | 3.81 | 16 | 12 | 9.7 | 10 | 8.1 | 33 | 26.6 | 27 | 21.8 | 42 | 33.9 |
| 945 | Weigh and grade poultry for market. | 123 | 3.55 | 3.45 | 86 | 3.71 | 21 | 3.81 | 16 | 13 | 10.6 | 8 | 6.5 | 36 | 29.3 | 31 | 25.2 | 35 | 28.5 |
| 946 | Determine proper space requirements. | 124 | 3.70 | 3.66 | 86 | 3.73 | 22 | 3.88 | 16 | 12 | 9.7 | 8 | 6.5 | 24 | 19.4 | 41 | 33.1 | 39 | 31.5 |
| 947 | Segregate poultry into groups according to weight, age, and sex. | 124 | 3.36 | 3.28 | 86 | 3.36 | 22 | 3.75 | 16 | 14 | 11.3 | 11 | 8.9 | 42 | 33.9 | 31 | 25.0 | 26 | 21.0 |
| 948 | Attach identification bands to legs or wings. | 124 | 3.12 | 3.06 | 86 | 3.18 | 22 | 3.38 | 16 | 18 | 14.5 | 15 | 12.1 | 42 | 33.9 | 32 | 25.8 | 17 | 13.7 |
| 949 | Clip wings. | 124 | 3.12 | 3.00 | 86 | 3.32 | 22 | 3.50 | 16 | 20 | 16.1 | 14 | 11.3 | 41 | 33.1 | 29 | 23.4 | 20 | 16.1 |
| 950 | Maintain routine disease and parasite control. | 122 | 3.62 | 3.62 | 84 | 3.50 | 22 | 3.75 | 16 | 11 | 99.0 | 11 | 9.0 | 31 | 25.4 | 30 | 24.6 | 39 | 32.0 |
| 951 | Provide proper lighting for sexual development and egg production. | 122 | 3.59 | 3.54 | 84 | 3.55 | 22 | 3.94 | 16 | 10 | 8.2 | 6 | 4.9 | 42 | 34.4 | 30 | 24.6 | 34 | 27.9 |
| 952 | Determine when pullets are mature for egg production. | 122 | 3.58 | 3.57 | 85 | 3.38 | 21 | 3.94 | 16 | 13 | 10.7 | 7 | 5.7 | 28 | 23.0 | 44 | 36.1 | 30 | 24.6 |
| 953 | Maintain proper bedding. | 123 | 3.43 | 3.33 | 85 | 3.64 | 22 | 3.69 | 16 | 12 | 9.8 | 14 | 11.4 | 35 | 28.5 | 33 | 26.8 | 29 | 23.6 |
| 954 | Determine feed requirements. | 123 | 3.68 | 3.64 | 85 | 3.64 | 22 | 3.94 | 16 | 13 | 10.6 | 6 | 4.9 | 27 | 22.0 | 39 | 31.7 | 38 | 30.9 |
| 955 | Provide appropriate temperature and ventilation. | 123 | 3.62 | 3.59 | 85 | 3.55 | 22 | 3.88 | 16 | 12 | 9.8 | 9 | 7.3 | 29 | 23.6 | 37 | 30.1 | 36 | 29.3 |
| 956 | Provide appropriate feeders and drinkers. | 123 | 3.62 | 3.58 | 85 | 3.68 | 22 | 3.75 | 16 | 11 | 8.9 | 8 | 6.5 | 35 | 28.5 | 32 | 26.0 | 37 | 30.1 |
| 957 | Properly maintain feeders and drinkers. | 122 | 3.52 | 3.47 | 85 | 3.50 | 22 | 3.80 | 15 | 13 | 10.7 | 13 | 10.7 | 27 | 22.1 | 36 | 29.5 | 33 | 27.0 |
| 958 | Provide appropriate nests and maintain bedding in nests. | 123 | 3.61 | 3.55 | 85 | 3.73 | 22 | 3.75 | 16 | 10 | 8.1 | 11 | 8.9 | 30 | 24.4 | 38 | 30.9 | 34 | 27.6 |
| 959 | Gather and clean eggs. | 123 | 3.42 | 3.34 | 85 | 3.27 | 22 | 4.00 | 16 | 13 | 10.6 | 16 | 13.0 | 37 | 30.1 | 21 | 17.1 | 36 | 29.3 |
| 960 | Grade and candle eggs. | 123 | 3.54 | 3.45 | 85 | 3.59 | 22 | 3.94 | 16 | 13 | 10.6 | 14 | 11.4 | 30 | 24.4 | 26 | 21.1 | 40 | 32.5 |
| 961 | Record egg production. | 123 | 3.51 | 3.46 | 85 | 3.41 | 22 | 3.94 | 16 | 11 | 8.9 | 16 | 13.0 | 35 | 28.5 | 21 | 17.1 | 40 | 32.5 |
| 962 | Pack eggs for storage and shipment. | 123 | 3.57 | 3.52 | 85 | 3.46 | 22 | 4.00 | 16 | 10 | 8.1 | 15 | 12.2 | 30 | 24.4 | 31 | 25.2 | 37 | 30.1 |
| 963 | Cull hens. | 120 | 3.67 | 3.58 | 83 | 3.62 | 21 | 4.19 | 16 | 13 | 10.8 | 9 | 7.5 | 25 | 20.8 | 31 | 25.8 | 42 | 35.0 |
| 964 | Maintain proper hen and rooster ratio. | 123 | 3.63 | 3.61 | 85 | 3.64 | 22 | 3.75 | 16 | 12 | 9.8 | 9 | 7.3 | 32 | 26.0 | 29 | 23.6 | 41 | 33.3 |

Appendix

CURRICULUM CODE NO. & TITLE T-01/ Agricultural Science and Mechanization

| Orig. No. | TASKS | Total No. Responses ( ) | MEAN |  |  |  |  |  |  | FREQUENCY ( N ) & PCT. OF FREQUENCY (ADJ.) |  |  |  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  |  |  | Group | Emplyr's | ( N ) | Emplye's | ( N ) | Educ's | ( N ) | 1 (N) | 1 Pct. | 2 (N) | 2 Pct. | 3 (N) | 3 Pct. | 4 (N) | 4 Pct. | 5 (N) | 5 Pct. |
| 965 | Candle and select eggs for hatching. | 123 | 3.56 | 3.47 | 85 | 3.64 | 22 | 3.94 | 16 | 13 | 10.6 | 12 | 9.8 | 31 | 25.2 | 27 | 22.0 | 40 | 32.5 |
| 966 | Keep breeding and egg production records. | 123 | 3.55 | 3.42 | 85 | 3.64 | 22 | 4.13 | 16 | 11 | 8.9 | 13 | 10.6 | 34 | 27.6 | 27 | 22.0 | 38 | 30.9 |
| 967 | Evaluate different breeding programs. | 123 | 3.59 | 3.53 | 85 | 3.68 | 22 | 3.75 | 16 | 11 | 8.9 | 11 | 8.9 | 31 | 25.2 | 35 | 28.5 | 35 | 28.5 |
| 968 | Develop appropriate breeding program. | 123 | 3.63 | 3.62 | 85 | 3.64 | 22 | 3.69 | 16 | 11 | 8.9 | 9 | 7.3 | 31 | 25.2 | 35 | 28.5 | 27 | 30.1 |
| 969 | Determine end of breeding period. | 121 | 3.55 | 3.48 | 83 | 3.68 | 22 | 3.75 | 16 | 12 | 9.9 | 9 | 7.4 | 34 | 28.1 | 32 | 26.4 | 34 | 28.1 |
| 970 | Formulate rations. | 123 | 5.54 | 3.48 | 85 | 3.50 | 22 | 3.88 | 16 | 16 | 13.0 | 6 | 4.9 | 35 | 28.5 | 28 | 22.8 | 38 | 30.9 |
| 971 | Select, weigh, and mix feed. | 122 | 3.45 | 3.39 | 84 | 3.41 | 22 | 3.81 | 16 | 15 | 12.3 | 12 | 9.8 | 31 | 25.4 | 31 | 25.4 | 33 | 27.0 |
| 972 | Provide proper storage for feed. | 122 | 3.59 | 3.54 | 84 | 3.55 | 22 | 3.94 | 16 | 12 | 9.8 | 10 | 8.2 | 27 | 22.1 | 40 | 32.8 | 33 | 27.0 |
| 973 | Calculate feed conversion factors. | 123 | 3.63 | 3.64 | 85 | 3.46 | 22 | 3.88 | 16 | 12 | 9.8 | 11 | 8.9 | 29 | 23.6 | 29 | 23.6 | 42 | 34.1 |
| 974 | Recognize nutrient deficiencies. | 121 | 3.70 | 3.66 | 83 | 3.64 | 22 | 4.00 | 16 | 10 | 8.3 | 18 | 14.9 | 15 | 12.4 | 33 | 27.3 | 45 | 37.2 |
| 975 | Wash and disinfect house and equipment. | 123 | 3.60 | 3.59 | 85 | 3.50 | 22 | 3.81 | 16 | 12 | 9.8 | 10 | 8.1 | 32 | 26.0 | 30 | 24.4 | 39 | 31.7 |
| 976 | Maintain dry litter. | 123 | 3.49 | 3.42 | 85 | 3.55 | 22 | 3.75 | 16 | 11 | 8.9 | 14 | 11.4 | 36 | 29.3 | 28 | 22.8 | 34 | 27.6 |
| 977 | Chemically treat litter. | 123 | 3.43 | 3.41 | 85 | 3.41 | 22 | 3.56 | 16 | 12 | 9.8 | 17 | 13.8 | 32 | 26.0 | 30 | 24.4 | 32 | 26.0 |
| 978 | Properly dispose of litter. | 123 | 3.49 | 3.41 | 85 | 3.59 | 22 | 3.75 | 16 | 10 | 8.1 | 17 | 13.8 | 38 | 30.9 | 19 | 15.4 | 39 | 31.7 |
| 979 | Have knowledge of environmental conditions causing health problems. | 123 | 3.75 | 3.64 | 85 | 4.00 | 22 | 4.00 | 16 | 11 | 8.9 | 9 | 7.3 | 25 | 20.3 | 33 | 26.8 | 45 | 36.6 |
| 980 | Identify disease symptoms. | 123 | 3.73 | 3.62 | 85 | 3.82 | 22 | 4.19 | 16 | 14 | 11.4 | 10 | 8.1 | 21 | 17.1 | 28 | 22.8 | 50 | 40.7 |
| 981 | Detect internal and external parasites. | 123 | 3.75 | 3.65 | 85 | 3.82 | 22 | 4.19 | 16 | 11 | 8.9 | 10 | 8.1 | 25 | 20.3 | 30 | 24.4 | 47 | 38.2 |
| 982 | Identify diseases. | 123 | 3.72 | 3.65 | 85 | 3.77 | 22 | 4.00 | 16 | 13 | 10.6 | 11 | 8.9 | 20 | 16.3 | 33 | 26.8 | 46 | 37.4 |
| 983 | Isolate infected poultry. | 123 | 3.69 | 3.60 | 85 | 3.86 | 22 | 3.94 | 16 | 12 | 9.8 | 7 | 5.7 | 33 | 26.8 | 26 | 21.1 | 45 | 36.6 |
| 984 | Put medication in drinking water. | 123 | 3.50 | 3.49 | 85 | 3.41 | 22 | 3.69 | 16 | 14 | 11.4 | 12 | 9.8 | 34 | 27.6 | 24 | 19.5 | 39 | 31.7 |
| 985 | Administer internal and external parasite treatment. | 123 | 3.51 | 3.44 | 85 | 3.59 | 22 | 3.81 | 16 | 16 | 13.0 | 7 | 5.7 | 34 | 27.6 | 30 | 24.4 | 36 | 29.3 |
| 986 | Properly store and use different antibiotics for different diseases. | 120 | 3.64 | 3.51 | 82 | 3.77 | 22 | 4.13 | 16 | 15 | 12.5 | 9 | 7.5 | 24 | 20.0 | 28 | 23.3 | 44 | 36.7 |

## APPENDIX D

## COMPETENCIES - CRITERION MEASURES

### Agricultural Science and Mechanization
### Agricultural Science

SUBJECT AREA: General Office Work

**TASK # A1:** File records, job sheets, service manuals, and other information.

**COMPETENCY:** File records, job sheets, service manuals, and all other information accurately using an established or accepted filing system.

**CRITERION MEASURE:**

1. Filing methods are identified and described accurately.
2. All materials are filed using an acceptable method with 100% accuracy.
3. The filing system is simple with ease of retrieving information.

**TASK # A2:** Schedule appointments.

**COMPETENCY:** Schedule several types of appointments over a specified time using letters, verbal, and telephone methods.

**CRITERION: MEASURE:**

1. Appointments are scheduled in a reasonable time frame so that they are met without difficulty.
2. Times of all appointments are clear to all parties involved.
3. All correspondence concerning appointments is courteous and informative, with all information provided correctly.

**TASK # A3:** Write notes, memos, and business letters.

**COMPETENCY:** Write notes, memos, business letters, and other correspondence using correct English and following acceptable business formats or procedures.

**CRITERION MEASURE:** All business correspondence is grammatically correct and follows acceptable business formats or procedures.

SUBJECT AREA: General Office Work

| | |
|---|---|
| TASK # A4: | Use telephone to order and/or sell materials, parts, equipment, product, etc. |
| COMPETENCY: | Use the telephone courteously and expediously to conduct business of ordering and selling materials, parts, equipment, products, etc. |
| CRITERION MEASURE: | 1. All telephone useage in conducting business is courteous, and no or very little time is wasted.<br>2. Before ordering or selling by telephone, all information is gathered and is available to refer to when talking on the phone.<br>3. Telephone rates are known and telephone methods are used that result in the cheapest rates possible. |

SUBJECT AREA: Recording Information

TASK # B5: Make bank deposits.

COMPETENCY: Make cash and check bank deposits.

CRITERION MEASURE:
1. Money is correctly counted and checks properly endorsed for deposit.
2. Saving and checking deposit slips are correctly completed.
3. Bank deposit procedures are correctly followed.

TASK # B6: Balance bank statements.

COMPETENCY: Balance bank statements following recommended procedures.

CRITERION MEASURE:
1. Errors are spotted in bank statements, check books, savings deposits and withdrawals, and corrections are made.
2. Check books and savings accounts are balanced.

TASK # B7: Maintain accounts payable and receivable.

COMPETENCY: Maintain payable and receivable accounts using an established or acceptable method to keep all accounts current.

CRITERION MEASURE: Payable and receivable accounts are properly recorded and filed for easy retrieval.

TASK # B8: Write checks.

COMPETENCY: Write complete, correct checks that clear banking channels.

CRITERION MEASURE:
1. Checks are written correctly as to amount, account, date, signature, etc.
2. Checks clear all banking channels.

**TASK # B9:** Record equipment maintenance information.

**COMPETENCY:** Record equipment maintenance information on specified or acceptable forms.

**CRITERION MEASURE:**

1. Reasons are correctly provided for keeping accurate information on equipment maintenance.
2. Equipment maintenance information is provided for each piece of equipment.
3. Each piece of equipment is identified and maintenance sheets and logs are accurately kept for proper posting.

**TASK # B10:** Maintain employee work records.

**COMPETENCY:** Use appropriate forms for recording work records of employees, file records accurately, and keep files current.

**CRITERION MEASURE:**

1. Appropriate employee work record forms are used to record necessary information.
2. Employee attendance and time cards are used daily and data is accurately recorded on forms and filed by employee name.
3. Vacation, sick leave, social security deductions, salary, and other deductions are maintained on appropriate forms for each employee and filed by employee name.
4. Employee progress records are accurately completed and records are filed alphabetically by employee name.

**TASK # B11:** Record farm receipts.

**COMPETENCY:**

1. Use appropriate forms to record farm receipts by pre-established categories, date sold, buyer, address and telephone number of buyer, and other needed information.
2. Develop a financial statement on farm receipts for a specified time period.
3. File receipt data and forms.

**CRITERION MEASURE:**

1. Receipt data is accurately recorded on appropriate forms.
2. Accurate financial statements on farm receipts are developed for specified time periods.
3. Receipt data and forms are properly filed.

**TASK # B12:** Record farm expenses.

**COMPETENCY:**
1. Use appropriate forms to record farm expenses by pre-established categories, date of purchase, seller, and other needed information.
2. Develop a financial statement on farm expenses for a specified time period.
3. File expense data and forms.

**CRITERION MEASURE:**
1. Expense data is accurately recorded on appropriate forms.
2. Accurate financial statements on farm expenses are developed for specified time periods.
3. Expense data and forms are properly filed.

**TASK # B13:** Maintain monthly summary of cash expenses and receipts.

**COMPETENCY:** Develop monthly financial statements of cash expenses and receipts by farm enterprise.

**CRITERION MEASURE:** Recorded cash expenses and receipts are used to correctly develop monthly financial statements by farm enterprise.

**TASK # B14:** Record time and work performed on job sheets.

**COMPETENCY:** Prepare time and work job sheets on jobs performed by individuals.

**CRITERION MEASURE:**
1. Accurate time is recorded on job sheets for jobs performed by individuals.
2. Record type of work on sheet performed on a job.
3. Type of work performed by individuals on jobs is accurately recorded on job sheets.

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| TASK # B15: | Record inventory information. |
| COMPETENCY: | Take inventory of equipment and supplies and record information on appropriate forms. |
| CRITERION MEASURE: | 1. An accurate inventory of equipment and supplies is taken periodically.<br>2. Inventory information is recorded on appropriate forms neatly and accurately. |

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| TASK # B16: | Record crop production information. |
| COMPETENCY: | 1. Record crop production information by crop enterprise, date and type of work performed, expenses and receipts.<br>2. Prepare summary statements for each crop enterprise at end of accounting period. |
| CRITERION MEASURE: | 1. Crop production information is recorded accurately and neatly on appropriate forms by crop enterprise as tasks or work is performed.<br>2. Summary statements by crop enterprise are prepared from information recorded on crop forms. |

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| TASK # B17: | Record livestock production information. |
| COMPETENCY: | 1. Record livestock production information by livestock enterprise, date and type of worked performed, expenses and receipts.<br>2. Prepare summary statements for each livestock enterprise at end of accounting period. |
| CRITERION MEASURE: | 1. Livestock production information is recorded accurately and neatly on appropriate forms by livestock enterprise.<br>2. Summary statements by livestock enterprise are prepared from information recorded on livestock forms. |

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SUBJECT AREA: Recording Information

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| TASK # B18: | Report and record accidents. |
| COMPETENCY: | 1. Report accidents to supervisor and proper legal authorities.<br>2. Record accurately information on accidents such as what happened, when it happened, possible causes of the accident, and who was involved. |
| CRITERION MEASURE: | 1. Accidents needing attention are properly reported to supervisors and legal authorities.<br>2. Correct accident information is promptly and accurately recorded. |

## SUBJECT AREA: Safety Precautions

**TASK # C19:** Follow safe work habits.

**COMPETENCY:** Work safely and apply proper work habits.

**CRITERION MEASURE:**

1. Safety practices and procedures are listed for safe operation and maintenance of equipment, maintenance of buildings, land, irrigation ponds, etc., and operation of farm vehicles.
2. Safe work habits are properly applied in laboratory, shop, and work experience situations.

**TASK # C20:** Identify potential safety hazards on equipment and around premises.

**COMPETENCY:**

1. Identify potential safety hazards on equipment, in facilities, and around premises.
2. Determine measures to reduce or eliminate potential safety hazards.

**CRITERION MEASURE:**

1. Potential safety hazards on equipment, in facilities, and around premises are correctly identified.
2. Measures to reduce or eliminate potential safety hazards are listed.

**TASK # C21:** Store chemicals properly.

**COMPETENCY:** Store chemicals used on the farm properly and safely.

**CRITERION MEASURE:**

1. Chemicals needing special storage are identified and proper storage procedures are followed.
2. All chemicals are stored following recommended instructions found on the labels.

SUBJECT AREA: Safety Precautions

**TASK # C22:** Use fire extinguishers properly.

**COMPETENCY:** Use correct fire extinguishers for given fire conditions and properly use the extinguishers.

**CRITERION MEASURE:**

1. Different types of fires are recognized and identified correctly.
2. Correct fire extinguishers are chosen for the various fire types.
3. Fire extinguishers are used correctly following recommended operating procedures.

**TASK # C23:** Determine appropriate clothing to wear.

**COMPETENCY:** Determine proper and appropriate clothes to wear for different jobs and situations.

**CRITERION MEASURE:**

1. The conditions for which appropriate clothes are worn are verbally explained.
2. Appropriate clothes are worn for performing various farm jobs.

**TASK # C24:** Ventilate work areas.

**COMPETENCY:** Properly ventilate work areas for various jobs.

**CRITERION MEASURE:**

1. The theory or reasons for correct ventilation are accurately provided.
2. The work areas for various jobs are properly and adequately ventilated.
3. Work areas are accurately checked to determine if areas are properly ventilated.

SUBJECT AREA: Safety Precautions

TASK # C25: Interpret information on labels and signs.

COMPETENCY: Read, interpret, and put into practice information found on labels and signs.

CRITERION MEASURE:
1. Labels and signs are correctly read and interpreted.
2. Directions, warnings, and procedures on labels and signs are properly followed when working with chemicals, operating equipment, etc.

TASK # C26: Use proper lifting and carrying methods.

COMPETENCY: Lift and carry objects so as not to damage the objects and maintain personal physical condition without injury.

CRITERION MEASURE:
1. Objects are hand lifted following recommended lifting procedures in order to avoid personal injury.
2. Objects are carried and deposited properly without damaging the objects or injurying oneself or others.

TASK # C27: Store inflammable materials properly.

COMPETENCY: Store inflammable materials (gases, chemicals, paints, etc.) following recommended procedures to protect them from all elements, dangers, and accidents.

CRITERION MEASURE: Inflammable materials are stored safely following recommended storage procedures.

TASK # C28: Adjust safety devices.

COMPETENCY: Adjust safety devices on machinery for personal safety.

CRITERION MEASURE: Safety devices are adjusted according to the manufacturer's recommendations.

## SUBJECT AREA: Safety Precautions

**TASK # C29:** Install safety devices.

**COMPETENCY:** Install safety devices according to manufacturer's and/or OSHA recommendations.

**CRITERION MEASURE:**

1. Safety devices are properly installed on appropriate parts of machinery and equipment.
2. Measurements and clearances of safety devices are followed according to OSHA regulations.
3. Safety devices are installed using appropriate tools and methods.

**TASK # C30:** Determine when climatic conditions provide unsafe work situations.

**COMPETENCY:** Evaluate climatic conditions in relation to the task being performed to determine when unsafe conditions exist.

**CRITERION MEASURE:**

1. Work is not performed when unsafe climatic conditions exist.
2. Work is resumed or continued when climatic conditions are satisfactory.

**TASK # C31:** Correct potential safety hazards.

**COMPETENCY:** Anticipate, identify, and correct potential safety hazards.

**CRITERION MEASURE:**

1. Potential safety hazards are recognized.
2. Corrective action is taken on recognized hazards.

**TASK # C32:** Remove debris from work areas.

**COMPETENCY:** Keep work areas neat, clean, and safe by periodically removing debris.

**CRITERION MEASURE:**

1. Work areas are kept free of debris.
2. Debris is removed as needed to insure safey and efficient operation of equipment and machinery.

**TASK # C33:** Use electrical connectors and safety devices.

**COMPETENCY:** Correctly install and use electrical connectors and safety devices for personal and property protection.

**CRITERION MEASURE:**

1. Proper electrical connectors are selected for each required use.
2. Correct safety devices, breakers, and switches are selected for each use.
3. Connectors and safety devices are properly installed, grounded, and tested.
4. All electrical safety precautions are observed when installing and testing the devices.

**TASK # C34:** Dispose of chemical containers properly.

**COMPETENCY:** Drain, rinse, and clean used empty chemical containers and dispose of them according to recommendations for that chemical.

**CRITERION MEASURE:**

1. Each chemical container is safely and completely emptied.
2. Each container is rinsed three times and drained each time for 30 seconds or more.
3. Holes are punched in empty container according to directions on label.
4. Containers are burned, buried, or destroyed in proper disposal manner in safe place.
5. All safety precautions are observed in disposing chemical containers.

**TASK # C35:** Interpret and follow OSHA regulations relating to farm enterprises.

**COMPETENCY:** Read, comprehend, interpret, and follow the OSHA regulations that pertain to all phases of farm work.

**CRITERION MEASURE:** OSHA rules and regulations pertaining to farm operations are correctly read, interpreted, and implemented.

SUBJECT AREA: Safety Precautions

**TASK # C36:** Dispose of excess chemicals properly.

**COMPETENCY:** Dispose of any excess leftover chemicals following recommended disposal procedures.

**CRITERION MEASURE:**

1. Usable excess chemicals are properly stored in original containers with labels.
2. State and federal laws regarding excess chemical disposition are known.
3. Unusable excess chemicals are deposited in deep trenches away from water, animals, etc. and covered with soil.
4. Public landfill areas are used for disposition of excess chemicals where applicable.

**TASK # C37:** Clean up chemical spills.

**COMPETENCY:** Clean, remove, and dispose of chemical spills and residues efficiently.

**CRITERION MEASURE:**

1. Chemical spills are cleaned and all residues removed.
2. Chemical spills and residues are disposed of according to established procedures.

**TASK # C38:** Recognize symptoms of injury or poison.

**COMPETENCY:** Recognize symptoms of injury or poison to individuals.

**CRITERION MEASURE:**

1. Injury and poison symptoms are correctly described.
2. Injury and poison symptoms are correctly identified.

## SUBJECT AREA: Safety Precautions

**TASK # C39:** Apply first aid to minor cuts, bruises, and burns.

**COMPETENCY:** Apply first aid to minor cuts, bruises, and burns following acceptable procedures.

**CRITERION MEASURE:**

1. First aid procedures for minor cuts, bruises, and burns are described correctly.
2. Wounds are properly cleaned and antiseptic is properly applied to cuts, bruises, and burns as needed.
3. Bleeding is stopped when needed using recommended procedures.
4. Bandages are properly applied to minor cuts, bruises, and burns.

**TASK # C40:** Use hand and power tools safely.

**COMPETENCY:** Use hand and power tools properly following manufacturer's safety recommendations.

**CRITERION MEASURE:**

1. Hand and power tools are attached correctly to power source.
2. Safety devices are adjusted and functioning as designed.
3. Proper tools are used for the task for which they were designed.
4. Proper attire is worn while operating hand and power tools.
5. Hand and power tools are operated properly and manufacturer's safety recommendations are followed.

**TASK # C41:** Interpret equipment safety instructions in operator's manual.

**COMPETENCY:** Read and apply equipment safety instructions in operator's manual.

**CRITERION MEASURE:**

1. Safety precautions listed in operator's manual are identified on given machinery and equipment.
2. Safety instructions on given equipment are demonstrated during operation.

SUBJECT AREA: Safety Precautions

TASK # C42: Interpret equipment safety symbols.

COMPETENCY: Recognize farm equipment safety symbols and interpret their meaning.

CRITERION MEASURE: Farm equipment safety symbols are correctly recognized and meanings are described.

SUBJECT AREA: Legal Requirements and Regulations

TASK # D43: Follow laws relating to chemical application and use.

COMPETENCY: Use and apply chemicals following all state and federal laws.

CRITERION MEASURE:

1. Where to find information on state and federal laws concerning use of chemicals is known.
2. Laws regulating the use and application of chemicals are followed.
3. Equipment used to apply chemicals is correctly and safely used.

TASK # D44: Interpret and follow feed additive mixing regulations.

COMPETENCY: Correctly interpret and follow regulations for adding feed additives and mixing them.

CRITERION MEASURE:

1. The regulations of the manufacturer and USDA for each feed additive are correctly read and interpreted.
2. The regulations are followed for additives for each type of livestock feed in the amount required per weighted feed batch.
3. Label restrictions for each additive on withdrawal times are followed for sale of meat, eggs, milk, or other products.
4. The necessary certificates certifying withdrawal periods are properly completed.

TASK # D45: Identify EPA regulations which apply to all farming enterprises--dairy, beef, swine, crop, poultry, vegetables, forage, etc.

COMPETENCY: Identify the EPA regulations pertaining to all phases of farming and correctly correlates each enterprise to its own regulations.

CRITERION MEASURE:

1. All specific regulations for each enterprise on safety are identified.
2. Each enterprise is identified as to license and regulation requirements.
3. Each EPA regulation on waste disposal, air pollutants and water use is identified and followed.
4. EPA regulations for all other pnases of each enterprise are identified.

SUBJECT AREA: Legal Requirements and Regulations

**TASK # D46:** Follow laws regarding applications of chemicals near specific locations.

**COMPETENCY:** Properly follow the laws regulating chemical applications near all specific locations.

**CRITERION MEASURE:**

1. Laws of chemical application near restricted areas of waters are identified and followed.
2. Laws of chemical use around non-target sensitive crops are identified and followed.
3. Laws of chemical application around target and non-target animals are identified and followed.
4. All chemicals are correctly applied in all phases of farming following regulations.
5. All safety rules and regulations are followed when applying chemicals.

**TASK # D47:** Follow government regulations regarding chemical tolerances and residue buildup.

**COMPETENCY:** Follow and comply with the residue buildup and tolerance laws of chemicals used.

**CRITERION MEASURE:**

1. The laws regarding drug use and withdrawal periods in livestock are identified and followed.
2. Government regulations and label restrictions of chemicals on crops and follow-up crops, waiting periods, and prohibitive succession are followed.
3. Waiting periods are observed before harvesting crops, selling livestock or milk for each chemical used.
4. Necessary paper work certifying proper chemical use is properly completed.

## SUBJECT AREA: Legal Requirements and Regulations

**TASK # D48:** Interpret and follow feed additives withdrawal laws and regulations.

**COMPETENCY:** Interpret and follow the feed additive withdrawal laws and regulations for all classes of livestock and methods of feeding.

**CRITERION MEASURE:**

1. Feed additive regulations on withdrawal of chemicals before sale of meat animals, animal products, and by-products are properly interpreted and followed.
2. The manufacturer's recommendations on feed additive withdrawal for livestock and rates of drugs that can be used and days required for complete withdrawal are followed.
3. Required certification of withdrawal of drugs is determined and appropriate paper work completed.

**TASK # D49:** Identify shipping regulations for animals and crops.

**COMPETENCY:** Correctly identify governmental shipping regulations for animals and for crops.

**CRITERION MEASURE:**

1. Regulations for shipping animals, for health certificates, for water, food, rest periods, and stress reduction are correctly provided.
2. Regulations for crop shipment, freedom of weed seeds, and other restrictions are correctly listed.
3. The rules and regulations for interstate and intrastate shipment of crops and livestock are correctly identified.

**TASK # D50:** Determine when to consult lawyers and specialists.

**COMPETENCY:** Determine when the situation requires the help of lawyers and legal specialists.

**CRITERION MEASURE:**

1. Situations or examples are provided when lawyers and other legal aid are needed.
2. Legal counsel is obtained when farm situations warrant them.

## SUBJECT AREA: Legal Requirements and Regulations

**TASK # D51:** Evaluate the regulations of various government programs.

**COMPETENCY:** Evaluate the many regulations of government programs pertaining to farming.

**CRITERION MEASURE:**

1. Regulations of government programs that pertain to farm operations are determined.
2. How regulation will affect the operation, acreages, payments, etc. are known.
3. Intelligent choices are made based on available information on whether to participate or not to participate in optional government programs.
4. Rules and regulations of the participating programs chosen are known and followed.

**TASK # D52:** Follow legal procedures for purchasing land.

**COMPETENCY:** Correctly follow land purchasing legal requirements.

**CRITERION MEASURE:**

1. Land purchasing legal requirements are listed.
2. Land to be bought has a clear title or deed and properly marked boundaries to avoid disputes with neighboring land owners.
3. Stamp (real estate type) regulation for a deed is followed and it is affixed.
4. Deed is signed by all necessary persons, including quit-claimants, in the preserves of a notary.
5. The new deed is recorded at county registrar of deeds office for permanent record.

**TASK # D53:** Follow legal regulations regarding writing wills and inheritance.

**COMPETENCY:** Write a will following all legal regulations and inheritance laws.

**CRITERION MEASURE:**

1. The major legal requirements for writing wills are listed.
2. A sample will is properly written that could be used as a legal document if so desired.

SUBJECT AREA: Legal Requirements and Regulations

TASK # D54: Identify the property rights of owners.

COMPETENCY: Identify the property rights of owners of real estate as regulated by law.

CRITERION MEASURE:

1. The rights of property owners are identified and listed including zoning codes and land uses.
2. Hunting and fishing rights, timber harvest, water rights, etc., are provided.
3. Owner's rights of entry upon land or property rented or leased to others are identified.
4. Owner's rights of property development and sale are listed.
5. Owner's rights to property protection are identified.

TASK # D55: Identify the rights and liabilities of tenants and landlords.

COMPETENCY: Correctly identify the rights and liabilities of tenants and landlords as prescribed by law.

CRITERION MEASURE:

1. Each party's rights in any tenant-landlord agreement pertaining to the farm are identified.
2. Each tenant's and landlord's liabilities and responsibilities in the agreement are identified.
3. The benefits and rewards of the landlord-tenant arrangement of land, equipment, crops, and livestock production as well as the cost of the shares of inputs to each are identified.

TASK # D56: Interpret and follow regulations regarding operation of vehicles by minors.

COMPETENCY: Correctly interpret and follow regulations regarding operation of vehicles by minors.

CRITERION MEASURE:

1. On-public-road and off-road operational regulations of farm and non-farm vehicles of individuals under 16 years of age and individuals 16-18 years of age are provided.
2. Insurance and liability regulations pertaining to operation of vehicles by individuals 18 years of age and younger are identified.

SUBJECT AREA: Legal Requirements and Regulations

TASK # D57: Interpret milk production standards.

COMPETENCY: Identify and interpret the production standards for milk.

CRITERION MEASURE:

1. The standards for the grades of milk produced are listed.
2. The legal levels of bacteria count allowable for each grade of milk are provided.
3. The regulations of equipment and milking techniques for the various grades of milk are identified.
4. The regulations for holding milk regarding containers and temperature are listed.
5. The regulations for transporting milk are identified.

**TASK # E58:** Identify tools.

**COMPETENCY:** Identify correctly all types and kinds of hand and power tools.

**CRITERION MEASURE:**

1. All hand tools are identified correctly.
2. All power tools are identified correctly.
3. The correct nomenclature for both power and hand tools are provided.

**TASK # E59:** Adjust tools.

**COMPETENCY:** Adjust all types of hand and power tools for proper and safe operation.

**CRITERION MEASURE:**

1. All types of hand and power tools are adjusted and set for correct and safe operation.
2. Tools are adjusted correctly from one job to another job.
3. Safety devices on all tools are maintained and properly adjusted for safe operation.

**TASK # E60:** Clean tools.

**COMPETENCY:** Clean all types of tools of dirt and foreign material using appropriate materials.

**CRITERION MEASURE:**

1. Proper cleaning materials for particular types of dirt, grease and oil, dust, etc. are selected.
2. Correct and safe procedures are used in cleaning tools.
3. Hand and power tools are properly cleaned and free of dirt and debris.

SUBJECT AREA: Using and Maintaining Hand and Power Tools

**TASK # E61:** Interpret tool operation instructions.

**COMPETENCY:** Read and interpret tool operation instructions correctly for various tools.

**CRITERION MEASURE:** Each procedure and safe operational instructions for each tool are correctly read and applied.

**TASK # E62:** Recondition broken hand tools.

**COMPETENCY:** Recondition and repair broken hand tools using appropriate materials and procedures.

**CRITERION MEASURE:**

1. Hand tool parts are replaced or repaired as needed in reconditioning.
2. Appropriate materials and procedures are used in repairing hand tools.
3. Broken, inoperative hand tools are restored to proper working condition.

**TASK # E63:** Select appropriate tools for specific jobs.

**COMPETENCY:** Select appropriate tools for specific jobs being worked upon.

**CRITERION MEASURE:** Proper types and sizes of tools are selected for specific jobs in order to be as efficient as possible.

**TASK # E64:** Sharpen tools.

**COMPETENCY:** Select and use proper sharpening devices and correctly sharpen all types of tools.

**CRITERION MEASURE:**

1. Correct sharpening devices, stones, or files are selected to be used on each tool to be sharpened.
2. All sharpening devices are correctly and safely operated.
3. All tools are sharpened following recommended procedures and to the manufacturer's recommendations when applicable.

**TASK # E65:** Store tools properly.

**COMPETENCY:** Store tools in a clean, dry storage facility following any manufacturer's recommendations for storage.

**CRITERION MEASURE:**

1. All tools are properly cleaned and inspected before storage.
2. Exposed metal is oiled to prevent rust and various parts are lubricated according to manufacturer's recommendations for storage.
3. Each tool is properly and safely stored, protecting it from falling, weather, and other hazards.

**TASK # E66:** Set up tools.

**COMPETENCY:** Correctly set up and adjust all types of tools as needed for specific jobs.

**CRITERION MEASURE:**

1. The procedures in the operator's manual are correctly followed in setting up tools for specific jobs.
2. Tools are properly set up and adjusted to include all safely precautions, including using shields, guards, and other devices.

**TASK # E67:** Properly use tools.

**COMPETENCY:** Use all types of tools following manufacturer's recommendations and recommended safety rules regarding each tool.

**CRITERION MEASURE:**

1. All types of hand and power tools are correctly used following recommended procedures utilizing the special safety precautions pertaining to each tool.
2. Tools are only used that are specifically designed for the job being done.
3. All bystanders are kept away at a safe distance from tools while tools are being used.
4. Appropriate eye goggles, face shields, and clothing are worn when using tools.

## SUBJECT AREA: Operating Equipment and Vehicles

**TASK # F68:** Interpret gauges.

**COMPETENCY:** Read and interpret gauges used on equipment and vehicles.

**CRITERION MEASURE:**

1. Each gauge that is used on vehicles and equipment is correctly identified.
2. Each gauge is correctly read during vehicle or equipment operation and normal or abnormal readings are indicated.
3. Vehicles and equipment are stopped when gauges indicate that continued operation might damage vehicles and equipment.

**TASK # F69:** Operate equipment and vehicles under working conditions.

**COMPETENCY:** Demonstrate the proper operation of equipment and vehicles under working conditions following the manufacturer's recommendations.

**CRITERION MEASURE:**

1. Equipment and vehicles are selected that are suited for the jobs to be done.
2. Equipment and vehicles are correctly and safely operated under working conditions following the manufacturer's recommendations.
3. The proper gear, throttle level, and equipment position is selected for each operation.

**TASK # F70:** Add wheel and front-end weights.

**COMPETENCY:** Add wheel weights to rear and front wheels and add front-end weights to tractor.

**CRITERION MEASURE:**

1. The proper amount of weight needed for particular situations is determined.
2. The wheel weights are positioned in the proper position and fastened tightly.
3. Front-end weights are properly positioned on the bar and secured.
4. All weights are safely lifted and handled.

SUBJECT AREA: Operating Equipment and Vehicles

**TASK # F71:** Connect front-end operated equipment.

**COMPETENCY:** Connect front-end operated equipment safely using correct tools, pins, and bolts, etc.

**CRITERION MEASURE:**

1. All safety procedures are followed concerning connecting front-end operated equipment.
2. Correct tools, bolts, pins, etc. are used in the proper places.
3. Front-end equipment works properly after connection.

**TASK # F72:** Connect hydraulic systems and hydraulic operated equipment.

**COMPETENCY:** Safely connect hydraulic systems and hydraulic operated equipment following recommended procedures.

**CRITERION MEASURE:**

1. Both ends of the hydraulic line connectors are properly cleaned.
2. Hydraulic pressure on lines is checked, releasing it if necessary for safe connection.
3. The connectors are inserted firmly, seating them and making sure they are locked in place.
4. The systems perform correctly with no leaks or reverse action due to incorrectly connected lines.

**TASK # F73:** Connect three-point hitch equipment.

**COMPETENCY:** Correctly connect three-point hitch equipment following recommended procedures.

**CRITERION MEASURE:**

1. Tractor is backed to the proper position for connecting the equipment and lift arms are adjusted hydraulically.
2. Lower lift arms are connected first by raising or lowering arms appropriate amount, pins are then locked.
3. Upper link arm is properly connected by inserting and locking pin.
4. All three arms are adjusted according to the need for proper working lengths recommended by the manufacturer.
5. All safety rules are followed in hitching, proper blocking of equipment to prevent falling during attachment, and proper alignment.

**TASK # F74:** Hitch towed equipment.

**COMPETENCY:** Hitch towed equipment properly for safe transport.

**CRITERION MEASURE:**

1. Towing vehicle is backed to proper place and hitch is adjusted to fit the equipment hitch.
2. Main holes are aligned on equipment and towing vehicle and the pin and appropriate lock pins or nuts are inserted to prevent accidental unhitching.
3. Safety chains are attached or cables are used on either the towed vehicle or equipment.
4. All safety rules are followed regarding hitching equipment and towing regulations.

**TASK # F75:** Interpret hand operating signals.

**COMPETENCY:** Interpret hand operating signals correctly for each intended operation.

**CRITERION MEASURE:**

1. Interpret and apply hand signals for starting, stopping, going forward or backward with vehicles and for speeding up or slowing down.
2. Interpret and apply hand signals for turning left or right, for lifting or lowering equipment, for cutting off engine, and other appropriate signals.
3. Carefully watch signalman, especially when operating equipment where visibility is impaired or in close quarters.
4. All safety rules and regulations are followed regarding vehicle operation while being guided by hand signals.

SUBJECT AREA: Operating Equipment and Vehicles

**TASK # F76:** Refuel power units.

**COMPETENCY:** Safely refuel power units with proper type fuel and filling techniques.

**CRITERION MEASURE:**

1. All power unit engines are stopped and electrical switches shut off before refueling.
2. Power unit is allowed to cool sufficiently to remove any explosion possibility.
3. The correct type of fuel is put into tank such as gasoline, diesel, LP-Gas, kerosene, etc.
4. No smoking or open flame is allowed within 50 feet of a refueling operation.
5. Hose nozzle is inserted into tank and fuel is pumped into tank without spillage.
6. Fuel tank is recapped immediately after filling and nozzle and hose is returned and secured to proper place.
7. All safety rules are followed regarding fueling tanks.

**TASK # F77:** Operate equipment and vehicles on public highways.

**COMPETENCY:** Safely and properly operate equipment and vehicles on public highways.

**CRITERION MEASURE:**

1. Laws regarding vehicles and equipment operation on the highways are correctly listed.
2. Operates or drives vehicles with safety to himself, the public, other vehicles on the roadways, and safety to his own vehicle and equipment.
3. Pulls machinery off road where possible to let drivers behind safely pass.
4. Drives as near to right side of road as possible, but not on edge which may cave in and overturn equipment.
5. All safety rules and regulations are followed, night movement of large machinery is avoided, and courteously helps other vehicles pass.

SUBJECT AREA: Operating Equipment and Vehicles

**TASK # F78:** Use appropriate power for specific purposes.

**COMPETENCY:** Choose the appropriate power equipment for specific purposes and safely use it.

**CRITERION MEASURE:**

1. Appropriate power equipment is chosen for a given task.
2. The proper power source is correctly and safely attached for each desired operation.
3. Each piece of power equipment is properly operated and malfunctions are corrected.
4. All safety rules regarding a given power source are followed.

**TASK # F79:** Make proper adjustment to equipment for most efficient operation.

**COMPETENCY:** Adjust equipment for the proper and most efficient operation possible.

**CRITERION MEASURE:**

1. Belts, pulleys, shafts, etc. are properly aligned for good efficiency.
2. Belts are adjusted to the correct tension to reduce slippage and heat.
3. Correct speeds are selected and maintained for various operations to meet manufacturer's recommendations.
4. All guards and shields are kept in place and all bolts are properly tightened.
5. All safety rules are followed in adjusting equipment.

SUBJECT AREA: Operating Equipment and Vehicles

**TASK # F80:** Interpret operating instructions in operator's manual.

**COMPETENCY:** Read, interpret, and follow the operating instructions in the operator's manual for various types of equipment.

**CRITERION MEASURE:**

1. The complete maintenance schedule on selected equipment is listed correctly from the operator's manual.
2. Proper adjustments are made from reading and interpreting the operator's manual for different operating conditions and for wear and tear on the machine.
3. Operating procedures are correctly interpreted for starting, stopping, and use of the machine.
4. Operational instructions are safely demonstrated to others.
5. Safety rules for each piece of equipment given in the operator's manual are observed.

**TASK # G81:** Add coolant to cooling systems.

**COMPETENCY:** Add correct amount of coolant to the system in a safe manner in order not to crack the block.

**CRITERION MEASURE:**

1. Appropriate coolant is added to the system in a safe manner when the engine is cold or when the engine is hot and running.
2. The radiator is filled to the proper level with the coolant.
3. The engine block is not cracked because of incorrect adding of the coolant.

**TASK # G82:** Add oil to equipment and vehicles.

**COMPETENCY:** Check engine oil level and add proper grade and weight of oil if necessary.

**CRITERION MEASURE:**

1. Engine oil level is identified on dip stick.
2. Proper grade and weight of oil is added to crankcase if needed.
3. After oil is added, engine oil level is at full mark on dip stick.

**TASK # G83:** Adjust carburetors.

**COMPETENCY:** Connect vacuum gauge, regulate air intake screw, regulate fuel adjustment screw, and adjust carburetors to manufacturer's vacuum specifications.

**CRITERION MEASURE:**

1. Vacuum gauge is connected correctly to vacuum line.
2. Air intake screw and fuel adjustment screw are correctly identified and located.
3. Vacuum gauge is properly read and interpreted.
4. Fuel-air mixture is adjusted until correct vacuum is obtained.

**TASK # G84:** Adjust clutch pedal free travel.

**COMPETENCY:** Loosen adjustment nut on pedal rod and adjust pedal to engage or disengage approximately 1½ inches from top of pedal.

**CRITERION MEASURE:**

1. The adjustment nut on pedal rod is located and properly loosened.
2. The pedal rod is increased or decreased for pedal engagement or disengagement at approximately 1½ inches from top of pedal.

**TASK # G85:** Bleed diesel fuel system.

**COMPETENCY:**

1. Loosen fuel line connection at the injector.
2. Turn engine until air bubbles disapate and tighten fuel line connection.
3. Loosen fuel line coupling on injector pump.
4. Turn engine until air bubbles disapate and tighten fuel line coupling.

**CRITERION MEASURE:**

1. Fuel line connections and couplings are correctly loosened.
2. Engine is turned until all air bubbles disapates.
3. Fuel line connections and couplings are tightened properly.
4. Engine starts when air has been eliminated from fuel system.

**TASK # G86:** Change oil and oil filters.

**COMPETENCY:** Remove oil from crankcase, remove and install filter, and replace proper grade and weight of oil to crankcase.

**CRITERION MEASURE:**

1. All oil is properly removed from crankcase.
2. Oil filter is removed and an appropriate new filter is properly installed.
3. The correct grade, weight, and amount of oil is selected and properly put into the crankcase.
4. No leakage of oil is noted after the job is completed.

**TASK # G87:** Change thermostats.

**COMPETENCY:** Locate the thermostat in top radiator inlet, remove the proper system components, and remove and install thermostat.

**CRITERION MEASURE:**

1. The thermostat is correctly located.
2. The proper component parts are disconnected without damaging them and the thermostat is correctly removed and replaced.
3. After installation, no leaks are observed in the system.

**TASK # G88:** Clean debris from equipment.

**COMPETENCY:** Clean dirt, grease, and debris from equipment using cleaning equipment and cleaner.

**CRITERION MEASURE:**

1. Equipment is free from debris, dirt, and grease.
2. Cleaning is done safely using proper types of equipment and cleaner.

**TASK # G89:** Grease equipment.

**COMPETENCY:** Grease all farm equipment using the correct type and amount of grease and properly use the manual and mechanical grease guns.

**CRITERION MEASURE:**

1. The correct type of grease is used to grease all equipment.
2. The correct amount of grease is used on equipment.
3. Manual and mechanical grease guns are correctly used.

**TASK # G90:** Inflate tires.

**COMPETENCY:** Inflate tires with water, chemicals, and air following recommended procedures.

**CRITERION MEASURE:**

1. Tires are inflated to the recommended pounds of air or fluid pressure.
2. Tire pressure gauge is used and read correctly.

**TASK # G91:** Inspect cooling system for leaks.

**COMPETENCY:** Visually inspect radiator and hoses for leaks and test system when engine is operating at normal temperature.

**CRITERION MEASURE:**

1. Entire cooling system is visually checked for leaks and possible leaks are noted.
2. Leaks in cooling system are identified by testing system when engine is operating at normal temperature.

**TASK # G92:** Install and adjust belts.

**COMPETENCY:** Loosen adjustment pulleys, install belts, and tighten pulleys until belts are adjusted to the proper tension.

**CRITERION MEASURE:**

1. Adjustment pulleys are located and properly loosened.
2. Belts are properly aligned on all pulleys.
3. Adjustment pulleys are tightened and belts are adjusted to the proper tension.

**TASK # G93:** Install and adjust chains.

**COMPETENCY:** Loosen adjustment pulleys, install chains, and tighten pulleys until chains are adjusted to the proper tension.

**CRITERION MEASURE:**

1. Adjustment pulleys are located and properly loosened.
2. Chains are properly aligned on all pulleys.
3. Adjustment pulleys are tightened and chains are adjusted to the proper tension.

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| TASK # G94: | Install and service battery. |
| COMPETENCY: | 1. Loosen and/or remove battery clamps, remove old battery, install new battery, and tighten battery clamps.<br>2. Service battery by recharging and adding water as needed. |
| CRITERION MEASURE: | 1. An appropriate battery is chosen for the machine.<br>2. Old battery is properly removed from the battery holder.<br>3. New battery is installed in holder and held in place by battery clamps.<br>4. Battery is recharged by using correct battery charger and cables are hooked correctly.<br>5. Water is added to batteries to the proper level. |

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| TASK # G95: | Interpret maintenance directions in operator's manuals. |
| COMPETENCY: | Read and interpret operator's manuals to determine maintenance procedures and specifications. |
| CRITERION MEASURE: | 1. Specific maintenance procedures and specifications are correctly read and verbally explained.<br>2. Maintenance procedures in operator's manuals are followed correctly when working on actual machines. |

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| TASK # G96: | Repack bearings. |
| COMPETENCY: | Repack wheel bearings by hand or by using wheel grease bearing packer. |
| CRITERION MEASURE: | 1. The wheel and component parts of the axle are correctly removed.<br>2. Wheel bearings are adequately packed with correct type of grease.<br>3. The components parts and wheel are replaced on the axle. |

**TASK # G97:** Replace and adjust spark plugs.

**COMPETENCY:** Remove spark plug wires, remove spark plugs, adjust gap on new plugs following manufacturer's specifications, install new plugs and replace spark plug wires.

**CRITERION MEASURE:**

1. Spark plug wires are removed without damaging the wire connectors.
2. Old spark plugs are removed using proper tools without breaking the plugs.
3. Gap on new plugs are adjusted to manufacturer's specifications.
4. New plugs are installed without cross-threading or damaging the plugs.
5. Spark plug wires are reconnected to the proper cylinders.

**TASK # G98:** Replace bearings and seals.

**COMPETENCY:** Remove and install wheel bearings and seals on front and back axles following recommended procedures.

**CRITERION MEASURE:**

1. Old wheel bearings and seals are correctly removed without damaging axle.
2. New bearings and seals are installed following recommended procedures.
3. After installation, the seals do not leak, the bearings do not overheat, and the front wheels spin freely without heat buildup.

**TASK # G99:** Replace diesel fuel nozzles.

**COMPETENCY:**

1. Remove fuel line from injection nozzle.
2. Remove injection nozzle from block.
3. Install new nozzle following recommended procedures and reconnect fuel line to injection nozzle.

**CRITERION MEASURE:** Injection nozzles are removed and replaced following recommended procedures and without leakage.

## SUBJECT AREA: Maintaining Equipment and Vehicles

**TASK # G100:** Replace spark plug wires.

**COMPETENCY:** Remove and replace individual spark plug wires, beginning with the number 1 cylinder wire and continuing consecutively.

**CRTIERION MEASURE:** Spark plug wires are replaced according to the correct firing order.

**TASK # G101:** Replace radiator hoses.

**COMPETENCY:**

1. Remove radiator hose clamps.
2. Remove hose from inlet and outlet nipple.
3. Select correct hose and place on inlet and outlet nipples.
4. Replace hose clamps.

**CRITERION MEASURE:**

1. Radiator hose clamps are removed without damaging the clamps or the screw.
2. Radiator hose is removed without damaging nipples.
3. Correct radiator hoses are selected to replace old hoses.
4. New hoses are installed and clamps replaced without damaging hoses, nipples, or clamps.
5. New hoses do not leak.

**TASK # G102:** Replace universal joints.

**COMPETENCY:** Remove nuts from universal joint, remove u-clamps, keep bearing cups in place, move universal shaft forward and slide universal shaft out. Install universal joints by reversing the process.

**CRITERION MEASURE:** Universal joints are taken out and replaced following recommended procedures.

TASK # G103: Service air cleaners.

COMPETENCY: Remove housing and replace oil bath and dry air cleaners.

CRITERION MEASURE:

1. Housing is removed that holds air cleaners.
2. Appropriate air cleaners are chosen and inserted in place.
3. Housing is properly replaced.

TASK # G104: Service fuel strainer, fuel filters, and sediment bowl on fuel systems.

COMPETENCY:

1. Disassemble the housing and remove the fuel strainer and replace with a new strainer.
2. Disassemble the fuel filter housing and remove the fuel filter and replace with a new fuel filter.
3. Loosen sediment bowl clamp, wash out sediment bowl, and add new gasket when replacing bowl.

CRITERION MEASURE:

1. Fuel strainer is located, removed, new strainer selected, and properly replaced.
2. Fuel filter housing is disassembled, fuel filter removed, new one selected, and properly installed.
3. Sediment bowl clamp is located, loosened, and bowl removed. Bowl is cleaned, properly replaced using a new gasket, and bowl does not leak after replacement.

TASK # G105: Time engines.

COMPETENCY:

1. Check engine timing by using a timing light and engine analyzer following specified procedures.
2. Set the timing according to manufacturer's specifications.

CRITERION MEASURE:

1. The timing light and engine analyzer are interpreted correctly.
2. Results of using the timing light and engine analyzer are interpreted correctly.
3. The timing is set correctly following manufacturer's specifications and following recommended procedures.

SUBJECT AREA: Maintaining Equipment and Vehicles

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| TASK # G106: | Prepare equipment for storage. |
| COMPETENCY: | Prepare equipment for storage by following instructions in operator's manuals. |
| CRITERION MEASURE: | Equipment storage instructions in operator's manuals are verbally explained and/or illustrated. |

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| TASK # G107: | Install carburetor repair kit. |
| COMPETENCY: | Disassemble carburetor, replace float, needle valve, needle valve seat, and carburetor jets and reassemble carburetor. |
| CRITERION MEASURE: | 1. Carburetor is disassembled correctly.<br>2. Carburetors parts are replaced according to recommended procedures.<br>3. Carburetor is reassembled correctly.<br>4. Engine receives the proper air-fuel mixture. |

## SUBJECT AREA: Inventorying the Farm Business

**TASK # H108:** Take physical inventory.

**COMPETENCY:** Take physical inventory of a farm business including equipment, land, buildings, and supplies.

**CRITERION MEASURE:**

1. Physical inventory is properly identified and categoried by type and/or use.
2. The correct amounts of inventory are provided.

**TASK # H109:** Determine inventory on hand.

**COMPETENCY:** Correctly count physical inventory.

**CRITERION MEASURE:**

1. Count physical inventory by type and/or use category.
2. Inventory by type and/or use category is taken on appropriate forms.

**TASK # H110:** Calculate depreciation.

**COMPETENCY:** Calculate depreciation by straight line, declining balance, and sum of the year digits methods.

**CRITERION MEASURE:**

1. Straight line, declining balance, and sum of the year digits methods of depreciation are calculated correctly.
2. A comparison of straight line, declining balance, and sum of the year digits methods of determining depreciation is made to allow for best tax credits.

**TASK # H111:** Determine when to take inventory.

**COMPETENCY:** Identify times when current inventory information is needed in making management decisions.

**CRITERION MEASURE:**

1. Inventory is taken to determine profit or loss for specified period as a month, quarter, half year, year or a specified production period.
2. Inventory is taken to determine net worth.
3. Inventory is taken to determine borrowing capacity of farm.

SUBJECT AREA: Inventorying the Farm Business

**TASK # H112:** Determine salvage values of depreciable assets.

**COMPETENCY:** Determine salvage values of depreciable assets following recommended guidelines.

**CRITERION MEASURE:**

1. Salvage values of depreciable assets are realistically assigned that adhere to Internal Revenue guidelines.
2. Salvage values are assigned that reflect market value of an asset at the end of its assigned years of useful life.

**TASK # H113:** Establish values on assets, land, buildings, and equipment.

**COMPETENCY:**

1. Calculate the value of land, buildings, and equipment by purchase price.
2. Calculate the value of land, buildings, and equipment by current replacement cost.
3. Calculate the value of depreciable assets by the depreciable remaining balance.

**CRITERION MEASURE:** Values on land, buildings, and equipment are correctly calculated by using various specified methods.

**TASK # H114:** Identify resources to be inventoried.

**COMPETENCY:** Correctly identify farm resources that need to be periodically inventoried.

**CRITERION MEASURE:** Resources that have a marketable value are correctly identified.

SUBJECT AREA: Inventorying the Farm Business

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| TASK # H115: | Identify resources which are depreciable and non-depreciable. |
| COMPETENCY: | Correctly place resources into depreciable and non-depreciable categories according to years of usefulness and resources recognized by the IRS as depreciable and non-depreciable. |
| CRITERION MEASURE: | Depreciable and non-depreciable resources are correctly identified from a list of farm resources. |

SUBJECT AREA: Planning and Supervising the Labor Supply

TASK # I116: Plan work schedules.

COMPETENCY: Develop work schedules for workers from tasks to be performed.

CRITERION MEASURE:

1. Work schedules are planned to allow maximum efficiency of labor and materials.
2. Work schedules are planned so that tasks are completed on time.

TASK # I117: Establish priorities on work to be completed.

COMPETENCY: Arrange a list of work to be completed by job priorities.

CRITERION MEASURE: High priority jobs are identified and arranged to make maximum use of labor and materials and to accomplish production goals.

TASK # I118: Identify peak labor periods.

COMPETENCY: Identify labor needs by stages (or periods) of a production period.

CRITERION MEASURE: Labor needs are accurately estimated for work to be done by stages (or periods) of a production period.

TASK # I119: Determine amount of labor needed.

COMPETENCY: Determine amount of labor needed for specific jobs in terms of number of workers and hours.

CRITERION MEASURE: Labor needs are accurately estimated to complete work to be done on time.

SUBJECT AREA: Planning and Supervising the Labor Supply

TASK # I120: Hire and fire workers and perform disciplinary action.

COMPETENCY: Establish personnel regulations and perform personnel actions such as promoting, firing, and disciplinary action.

CRITERION MEASURE:

1. Personnel regulations are established that are practical and meet the needs of the farm operation.
2. Personnel actions are performed as indicated in personnel regulations or as situations demand.

TASK # I121: Train workers to perform tasks.

COMPETENCY:

1. Demonstrate tasks to be performed to workers.
2. Set up a training program for new employees and an ongoing inservice program.

CRITERION MEASURE:

1. A thorough and effective training program is developed for training new employees for selective jobs.
2. An ongoing inservice program is developed for keeping all employees current and motivated.
3. Employees are properly trained to perform assigned task.

TASK # I122: Evaluate workers' performance.

COMPETENCY: Develop evaluation procedure and objectively evaluate employee performance.

CRITERION MEASURE:

1. An evaluation procedure is developed that is practical, objective, and meets the needs of the farm operation.
2. Employee performance is objectively evaluated based on the established criteria for the job and utilizing the developed evaluation procedure.

TASK # I123: Assign specific responsibilities to workers.

COMPETENCY: Assign specific responsibilities to workers.

CRITERION MEASURE: Work responsibilities are defined and employee skills and expertise are matched to the work responsibilities.

TASK # I124: Establish pay scale and benefits for workers.

COMPETENCY: Establish pay scale and benefits for workers.

CRITERION MEASURE:

1. Employee wages are established for specific job situations that are practical for hours and working conditions.
2. Employee benefits are established for specific job and tenure situations.

TASK # I125: Identify labor available.

COMPETENCY: Identify labor available for specific job needs by legal and ethical methods.

CRITERION MEASURE:

1. Available labor is identified based on needed qualifications for specific jobs.
2. Legal requirements are known and followed.
3. Labor needs are estimated accurately for specific jobs.

TASK # I126: Evaluate influence labor utilization has on farm income.

COMPETENCY: Determine relationship between farm income and different forms (types) of labor.

CRITERION MEASURE: Different forms of labor are identified and the change in farm income is calculated for each form of labor while other factors remain unchanged.

SUBJECT AREA: Planning and Supervising the Labor Supply

**TASK # I127:** Identify ways to reduce inefficient use of labor.

**COMPETENCY:** Identify inefficient use of labor and take appropriate action to improve efficiency.

**CRITERION MEASURE:**

1. Labor is identified that is idle for periods of time.
2. Labor that has more potential for responsibility is identified.
3. Training needs of labor are recognized.
4. Labor that is not matched for the job is recognized.
5. Ways to utilize labor in periods with low labor requirements are identified.

**TASK # I128:** Determine whether to hire more labor or hire custom services.

**COMPETENCY:** Determine advantages and disadvantages of hiring more labor to hiring custom services and make a rational decision.

**CRITERION MEASURE:**

1. The advantages of hired labor and custom services are accurately listed.
2. The disadvantages of hired labor and custom services are accurately listed.
3. Hired labor and custom services are compared on a cost basis, quality of work, length of time required by job, urgency of job, and a rational decision is made.

**TASK # I129:** Determine whether to do work yourself or hire it done.

**COMPETENCY:** Determine when a job should be done by yourself or when to hire it done.

**CRITERION MEASURE:**

1. The advantages of doing a job yourself and of hiring it done are listed.
2. The disadvantages of doing a job yourself and of hiring it done are listed.
3. A rational decision is made after comparing cost of the two methods, quality of work, length of time required by the job, urgency of the job, and demands on yourself by other jobs.

## SUBJECT AREA: Purchasing Supplies

**TASK # J130:** Determine amount to order.

**COMPETENCY:** Determine amount of supplies and/or equipment to order.

**CRITERION MEASURE:** Supply and/or equipment needs are analyzed based on past records, present production, and future goals.

**TASK # J131:** Determine what to order.

**COMPETENCY:** Determine type of supplies and/or equipment needed.

**CRITERION MEASURE:**

1. Production methods are analyzed to determine supply and equipment needs.
2. Types of supplies and equipment to order are based on present and future needs.

**TASK # J132:** Determine when to order.

**COMPETENCY:** Determine when to order supplies.

**CRITERION MEASURE:**

1. Supplies are ordered in time to be on hand for timely production schedules.
2. Supplies are ordered to take advantage of pre-season discounts where appropriate.
3. Supplies are ordered so that storage facilities will accommodate them.

**TASK # J133:** Compare costs and quality of products from various sources.

**COMPETENCY:** Compare costs and quality of products from various sources.

**CRITERION MEASURE:**

1. Costs on a per unit basis are compared from various sources.
2. Labels are correctly read and interpreted to compare quality of products.

## SUBJECT AREA: Purchasing Supplies

**TASK # J134:** Determine amount of supplies to keep on hand.

**COMPETENCY:** Identify amount of supplies needed to carry on continuous production.

**CRITERION MEASURE:**

1. Types and quantities of supplies needed are determined based on past records and present and future needs.
2. Inventories of supplies are accurately determined for selected farm enterprises.

**TASK # J135:** Identify sources of supplies.

**COMPETENCY:** Identify various sources of supplies and equipment.

**CRITERION MEASURE:**

1. Various methods for determining sources of supplies and equipment are listed.
2. Sources of supplies are selected based on reputable sources of information.

**TASK # J136:** Evaluate future supply needs.

**COMPETENCY:** Determine future supply needs.

**CRITERION MEASURE:** The factors for determining future supply needs are correctly listed and verbally explained.

## SUBJECT AREA: Insuring the Farm Business

**TASK # K137:** Determine amount of insurance needed.

**COMPETENCY:** Determine amount of insurance needed for various farm resources.

**CRITERION MEASURE:**

1. Replacement values of items to be insured are estimated.
2. Undepreciated value of items to be insured are correctly determined.
3. Appropriate types and amounts of insurance are correctly determined to cover identified risks.

**TASK # K138:** Determine kind and type of insurance needed.

**COMPETENCY:** Determine kind and type of insurance needed to reduce the risk load of the farm.

**CRITERION MEASURE:**

1. Specified kinds and types of insurance are described.
2. Examples of farm items needing insurance coverage are listed.
3. The kind and type of insurance needed to cover the identified items are provided.

**TASK # K139:** Determine what to insure.

**COMPETENCY:** Determine what should be insured in the farm business.

**CRITERION MEASURE:**

1. Reasons for insuring certain farm resources are listed.
2. Production resources that carry high risk potential and are difficult to replace are identified for insurance coverage.

## SUBJECT AREA: Insuring the Farm Business

**TASK # K140:** Determine when to insure.

**COMPETENCY:** Determine when to insure farm resources.

**CRITERION MEASURE:**

1. Various conditions and examples are provided for determining when to insure farm resources.
2. Case studies are carefully analyzed and correct decisions are made on when various resources should be insured.

**TASK # K141:** Evaluate advantages and disadvantages of insurance plans.

**COMPETENCY:** Identify advantages and disadvantages of different kinds and types of insurance.

**CRITERION MEASURE:** Advantages and disadvantages of different kinds and types of insurance are listed and discussed.

**TASK # K142:** Identify sources of insurance.

**COMPETENCY:** Identify sources of insurance that offer the type and kind of insurance needed by the farm.

**CRITERION MEASURE:**

1. Various sources of insurance are identified.
2. Insurance sources are correctly identified by type and kind of insurance offered.
3. Insurance sources are matched with the insurance needs of the farm.

SUBJECT AREA: Planning and Organizing the Farm Business

**TASK # L143:** Determine the type of farm to be developed.

**COMPETENCY:** Determine enterprises best suited for the farm and its available resources.

**CRITERION MEASURE:**

1. Enterprise resource requirements are matched with farm resources available.
2. Market potential for products are correctly analyzed as well as the farm's ability to produce.
3. Managerial abilities required for selected farm types are recognized and matched with managerial abilities available on the farm.
4. Farm enterprises are selected that best suit the available resources.

**TASK # L144:** Determine the size of farm to be developed.

**COMPETENCY:** Determine the optimum size farm business.

**CRITERION MEASURE:**

1. The factors that influence the optimum size farm business are listed and adequately discussed.
2. Capital, labor, management, and land resource requirements for various size farm businesses are correctly determined.
3. Income goals for the farm business are established.
4. The enterprise or enterprises that most fully utilize available resources and maximize the net income are determined.
5. The optimum size farm business is determined after analyzing the many factors that are important in making the decision.

SUBJECT AREA: Planning and Organizing the Farm Business

**TASK # L145:** Determine whether to have joint ownership.

**COMPETENCY:** Determine whether joint ownership is a rational approach to operating a farm business.

**CRITERION MEASURE:**

1. Advantages and disadvantages of joint ownership are listed and discussed.
2. Situations where joint ownership is beneficial to both parties are provided.
3. The necessary characteristics of a partnership agreement are identified.
4. Advantages and disadvantages of alternative types of ownership are listed.

**TASK # L146:** Determine whether to incorporate.

**COMPETENCY:** Determine whether incorporation is a rational approach to farm management and estate planning.

**CRITERION MEASURE:**

1. Advantages and disadvantages of incorporating a farm business are listed.
2. The legal requirements for incorporating a farm business are provided.
3. The long term effects of incorporating a farm business are identified.
4. Alternative ownership types are described and compared to incorporation as a form of ownership.

**TASK # L147:** Determine whether to participate in government programs.

**COMPETENCY:** Evaluate government programs and make rational decisions on whether to participate in the programs.

**CRITERION MEASURE:**

1. Purposes of various government programs are listed and discussed.
2. Where government programs can be used to accomplish the goals of the farm business are identified.
3. Advantages and disadvantages of various government programs are listed.

**TASK # L148:** Determine whether to specialize or diversify.

**COMPETENCY:** Determine whether to specialize or diversify the farming situation.

**CRITERION MEASURE:**

1. Factors relating to specialization and diversification are identified and discussed.
2. Farm resources are correctly identified as to their adaptability to specialization and diversification.
3. Unused resources are recognized that may be utilized in an alternative enterprise.
4. Advantages and disadvantages of specialization versus diversification are listed.
5. Farm goals are analyzed in relation to specialization and diversification.

**TASK # L149:** Develop overall farm plan.

**COMPETENCY:** Develop an overall farm plan.

**CRITERION MEASURE:**

1. All resources needed for a farm business are identified.
2. Farm and family goals are listed.
3. Factors necessary for a successful farm are provided.
4. A cash flow for the farm including living expenses is established.
5. Investment capital is accurately estimated and investment capital is matched with capital available.
6. Available resources are allocated to enterprises according to income producing potential.

**TASK # L150:** Establish farm family goals.

**COMPETENCY:** Establish farm family goals.

**CRITERION MEASURE:**

1. The reasons for establishing farm family goals are listed.
2. The importance of goals other than maximizing net income are adequately discussed.
3. Goals that are realistically attainable in the immediate, intermediate, and long-range time periods are chosen.
4. Those affected by the goals are involved in establishing goals.

**SUBJECT AREA:** Planning and Organizing the Farm Business

**TASK # L151:** Establish priorities for utilization of resources.

**COMPETENCY:** Establish priorities for utilization of resources.

**CRITERION MEASURE:**

1. Farm enterprises are ranked according to priorities set by the farm goals.
2. Resources are identified and matched with the enterprise priority list.
3. Resources are used from the most productive to the least productive in accomplishing the farm goals.

**TASK # L152:** Identify improvements to be made.

**COMPETENCY:** Identify improvements that will increase production efficiency for the various farm enterprises.

**CRITERION MEASURE:**

1. Farm enterprises are analyzed and improvements are identified that will increase production efficiency.
2. Cost of improvements are calculated and compared with expected increased returns.

SUBJECT AREA: Summarizing and Analyzing the Farm Business Records

TASK # M153: Calculate crop production efficiency factors.

COMPETENCY: Calculate crop production efficiency factors.

CRITERION MEASURE:

1. Factors associated with crop production efficiency factors are listed and discussed.
2. Resources used are accurately determined for various crops produced.
3. Crop production is accurately determined for various crops produced.
4. Using resource factors and crop production levels, crop production efficiency is accurately calculated.

TASK # M154: Calculate family labor and management income.

COMPETENCY: Calculate net farm returns for family labor and management.

CRITERION MEASURE:

1. Total farm production cost is accurately determined excluding any expense for family labor or management.
2. Total farm income is accurately determined.
3. Using total farm production cost and total farm income, the net farm return to family labor and management is accurately calculated.

TASK # M155: Calculate investment credit.

COMPETENCY: Calculate investment credit.

CRITERION MEASURE: Investment credit is accurately calculated using and following Internal Revenue Service procedures.

**TASK # M156:** Calculate labor efficiency factors.

**COMPETENCY:** Determine and accurately calculate labor efficiency factors.

**CRITERION MEASURE:**

1. Labor efficiency factors are listed and adequately discussed.
2. Director labor - production relations are determined.
3. Labor - yield or labor - production efficiency factors as pounds per hour, bushels per hour, acres per hour, etc. are accurately calculated.

**TASK # M157:** Calculate machinery use efficiency factors.

**COMPETENCY:** Determine and calculate machinery use efficiency factors.

**CRITERION MEASURE:**

1. Factors related to machinery use efficiency are provided and discussed.
2. Machinery - use relations are determined.
3. Machinery - use production efficiency factors as acres per hour, tons per hour, etc. are accurately calculated.

**TASK # M158:** Calculate management income.

**COMPETENCY:** Calculate net farm returns for management.

**CRITERION MEASURE:**

1. Total farm production cost is determined including family labor.
2. Total farm income is accurately calculated.
3. Using total farm production cost (1 above) and total farm income, the return to management is determined for the farm.

SUBJECT AREA: Summarizing and Analyzing the Farm Business Records

**TASK # M159:** Calculate net farm equity.

**COMPETENCY:** Calculate net farm equity.

**CRITERION MEASURE:**

1. Total current market value for the farm and its inventory is accurately determined.
2. Total current farm and inventory debit is determined.
3. Using total market value and total farm debt, current net farm equity is determined.

**TASK # M160:** Calculate net farm profit.

**COMPETENCY:** Calculate net farm profit for a specified period of time.

**CRITERION MEASURE:**

1. Total farm expenses are calculated, including depreciation and overhead.
2. Total farm income is calculated.
3. Using the above calculations, net farm profit is accurately calculated.

**TASK # M161:** Calculate net return to capital.

**COMPETENCY:** Calculate net return to capital investment.

**CRITERION MEASURE:** Net return to capital investment is accurately calculated using total capital investment and total farm income figures.

**TASK # M162:** Calculate rate of capital turnover.

**COMPETENCY:** Correctly calculate the rate of capital turnover for the farm business.

**CRITERION MEASURE:**

1. Factors influencing rate of capital turnover are identified.
2. Rate of capital turnover is determined for a farm business.

**SUBJECT AREA:** Summarizing and Analyzing the Farm Business Records

**TASK # M163:** Calculate rate of return to capital.

**COMPETENCY:** Correctly calculate the rate of return to capital for a farm business.

**CRITERION MEASURE:** Rate of return to capital is correctly calculated.

**TASK # M164:** Calculate operating margin.

**COMPETENCY:** Define operating margin and correctly calculate operating margin for a farm business.

**CRITERION MEASURE:** Operating margin is correctly defined and calculated.

**TASK # M165:** Calculate percent of gross income absorbed by overhead.

**COMPETENCY:** Correctly calculate percent of gross income used to pay overhead cost.

**CRITERION MEASURE:**

1. Gross income is correctly determined.
2. Overhead cost is accurately determined.
3. Using gross income and overhead cost figures, the percent of gross income used to pay overhead cost is determined.

**TASK # M166:** Close and summarize the cash book at end of year.

**COMPETENCY:** Close and summarize the cash book at the end of the fiscal year for a farm business.

**CRITERION MEASURE:**

1. Sources of cash income are identified and summarized using appropriate forms.
2. Sources of cash expenses are identified and summarized using appropriate forms.
3. Using figures determined above, the cash book is correctly summarized and closed.

TASK # M167: Complete tax forms.

COMPETENCY: Complete state and federal annual tax forms for the farm business following tax laws and guidelines.

CRITERION MEASURE:

1. Federal and state tax laws and guidelines are defined and described.
2. Appropriate state and federal tax forms are used and properly completed.

TASK # M168: Determine whether to pay taxes on cash or accrual basis.

COMPETENCY: Correctly select between cash method and accrual method of computing taxes.

CRITERION MEASURE:

1. Taxes are correctly computed by cash method.
2. Taxes are correctly computed by accrual method.
3. Correct method is selected in keeping with farm goals.

TASK # M169: Determine amount of social security to be paid.

COMPETENCY: Determine the amount of social security tax to be paid for a farm business for a specified time period using appropriate tax tables and guides.

CRITERION MEASURE:

1. Social security tax laws and guidelines are adequately discussed that pertain to farm businesses.
2. Appropriate social security tax forms are used and properly completed.
3. The amount of social security tax is correctly determined for a specified time period.

SUBJECT AREA: Summarizing and Analyzing the Farm Business Records

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| TASK # M170: | Determine amount of taxes to be paid. |
| COMPETENCY: | Compute amount of taxes to be paid by the farm business for a specified time period following tax laws and guidelines. |
| CRITERION MEASURE: | 1. Approximate tax laws and guidelines are used and interpreted correctly in determining taxes to be paid.<br>2. Appropriate tax forms are used and correctly completed.<br>3. Amount of taxes to be paid are accurately computed. |

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| TASK # M171: | Determine capital gains or losses. |
| COMPETENCY: | Determine capital gains or losses for a farm business for a specified time period. |
| CRITERION MEASURE: | 1. Factors affecting capital gains or losses are identified.<br>2. Capital gains or losses are accurately calculated. |

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| TASK # M172: | Determine the personal and farm share of expenses. |
| COMPETENCY: | Distinguish between personal expenses and farm expenses for tax purposes. |
| CRITERION MEASURE: | 1. Personal expenses are correctly identified and accurate records are maintained.<br>2. Farm expenses are correctly identified and accurate records are maintained.<br>3. A summary sheet of personal expenses and farm expenses is developed for a fiscal year. |

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| TASK # M173: | Estimate income tax. |
| COMPETENCY: | Estimate income tax using current and projected income and expense figures. |
| CRITERION MEASURE: | A reasonable estimate of taxes is made using tax tables and projected figures for income and expenses. |

**SUBJECT AREA:** Summarizing and Analyzing the Farm Business Records

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| TASK # M174: | Identify strengths and weaknesses of the farm business. |
| COMPETENCY: | Identify areas of the farm business that make the larger contributions toward meeting farm goals and identify those areas that make small or no contributions to the farm business goals. |
| CRITERION MEASURE: | 1. Strengths of the farm business are properly identified.<br>2. Weaknesses of the farm business are properly identified.<br>3. Farm goals are considered in determining which areas of the farm business are strong or weak. |

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SUBJECT AREA: Marketing Agricultural Products

**TASK # N175:** Calculate expected returns and profits on sales.

**COMPETENCY:**
1. Calculate costs of producing farm products.
2. Calculate amount of expected return from sale of farm products.
3. Calculate expected amount of profit from farm products.

**CRITERION MEASURE:**
1. Costs of resources for producing farm products are estimated.
2. Estimated returns from products are accurately calculated.
3. Estimated profits are calculated based on expenses and sale of products.

**TASK # N176:** Determine feasibility of participating in futures market.

**COMPETENCY:** Determine whether or not to participate in futures market involving various farm products.

**CRITERION MEASURE:**
1. Participation in the futures market is adequately explained.
2. Estimated profits from the expected sale of products versus participation in the futures market are calculated.
3. Legal implications of participation in the futures market are adequately explained.

**TASK # N177:** Select markets.

**COMPETENCY:** Select markets that fulfills the objectives of the marketing program of the farm.

**CRITERION MEASURE:**
1. Marketing objectives for the farming enterprises are adequately stated.
2. Available markets for the products to be sold are determined.
3. Markets are analyzed for sales records, marketing costs, distance to travel and other expenses.
4. Markets are selected that most nearly reach the marketing objectives of the various enterprises.

SUBJECT AREA: Marketing Agricultural Products

TASK # N178: Interpret market reports.

COMPETENCY: Interpret the information that is given in various agricultural journals and specialized marketing reports.

CRITERION MEASURE:
1. Units of measurement used in reporting are interpreted correctly.
2. Grades of livestock and other farm products are correctly defined.
3. Prices, price trends, and other market information are correctly interpreted.

TASK # N179: Analyze market cycles.

COMPETENCY: Analyze the cycles of supply and demand for farm products.

CRITERION MEASURE:
1. Past trends for specified farm products are determined.
2. The effect of supply and demand on various farm products is explained.
3. The projected supplies of products are determined.
4. Expected increased or decreased demand for farm products is determined.

TASK # N180: Select appropriate marketing system.

COMPETENCY: Determine and select a marketing system that is most appropriate to the farm enterprises and marketing objectives.

CRITERION MEASURE:
1. Various types of marketing systems are described and analyzed.
2. Marketing goals and objectives are compared with various marketing systems.
3. A marketing system is selected that is most appropriate for the particular enterprises engaged in.

SUBJECT AREA: Marketing Agricultural Products

TASK # N181: Determine influence middlemen have on farmer's prices.

COMPETENCY: Determine the effect middlemen have on prices of agricultural products.

CRITERION MEASURE:

1. Marketing procedures are correctly analyzed and discussed.
2. Fees or commissions charged by buyers of farm products are correctly determined.
3. Price deductions imposed on farmers' products at the time of sale are listed.
4. The role of middlemen is described.

TASK # N182: Determine if products should be held over for another year's income.

COMPETENCY: Determine if it will be most profitable to hold products for an additional year.

CRITERION MEASURE:

1. Market demand and current prices are correctly determined.
2. Projected prices at various times are determined.
3. Cost of storing or holding products is correctly calculated.
4. Costs and returns are compared for selling products and for holding for an additional time period.

TASK # N183: Determine when to market.

COMPETENCY: Determine the most profitable time to market farm products.

CRITERION MEASURE:

1. Demand and price for products at the present time are determined.
2. Expected prices at various future times are determined.
3. Expected loss in quality and storage costs of products are correctly calculated.
4. Marketing factors are analyzed and appropriate recommendations are made on when to market farm products to maximize profits.

SUBJECT AREA: Marketing Agricultural Products

TASK # N184: Develop marketing plan.

COMPETENCY: Develop a plan of marketing farm products in a manner that will be most profitable.

CRITERION MEASURE:

1. The factors to consider in developing a marketing plan are correctly listed.
2. Goals for a marketing plan are developed.
3. Price trends and local and regional market conditions are described.
4. Specific farm enterprises are evaluated and an appropriate marketing plan is developed for each enterprise.

TASK # N185: Determine influence substitutes have on agricultural products.

COMPETENCY: Determine the influence that substitutes have on the marketability of agricultural products.

CRITERION MEASURE:

1. The nonagricultural products that are substitutes for agricultural products are identified.
2. The competition that substitute products places on agricultural products is correctly described.
3. The estimated loss in sales of agricultural products due to substitute product sales is correctly determined on the state and national level.
4. The effect of substitute product sales on individual farmers is correctly described.

TASK # N186: Determine when products are ready for market.

COMPETENCY: Determine the stage at which products are best marketable.

CRITERION MEASURE:

1. The stages of ripeness, curing, grades, and other conditions of products that affect marketing are described.
2. Optimum demand for specific stages of products are correctly determined.
3. Price differentials for different stages of products are listed.

SUBJECT AREA: Marketing Agricultural Products

TASK # N187: Determine influence supply and demand has on prices.

COMPETENCY: Determine the influence that supply and demand has on the prices that a farmer can expect to receive for his products.

CRITERION MEASURE:

1. The effects that oversupply and undersupply have on prices of products are correctly described.
2. The effects that high and low demand have on prices of products are correctly described.
3. A graphic illustration of the effect of supply and demand on prices is correctly drawn.

**TASK # 0188:** Calculate construction, remodeling, and repair costs.

**COMPETENCY:** Calculate the total costs that will be incurred when construction, remodeling, or repairs are done on farm facilities.

**CRITERION MEASURE:**

1. A bill of materials is correctly developed for specific construction projects on the farm.
2. Estimated costs of materials are correctly determined and listed.
3. The amount and cost of labor required to complete the jobs are correctly estimated.
4. Indirect costs are listed and accurately estimated.
5. All costs are computed and realistic total cost figures are developed for construction, remodeling, and repairs on farm facilities.

**TASK # 0189:** Determine returns expected from building investments.

**COMPETENCY:** Determine all returns that may be expected from capital invested in buildings.

**CRITERION MEASURE:**

1. Increases in efficiency that may be obtained by investing in buildings are correctly estimated.
2. Tax breaks that may be realized by building investments are determined.
3. Increases in the size of farm enterprises by investing in additional buildings are accurately estimated.
4. Total returns that may accrue by capital invested in buildings are determined.

**TASK # 0190:** Determine size of building and structures needed.

**COMPETENCY:** Determine sizes of buildings and structures that maximizes profits for farming programs.

**CRITERION MEASURE:**

1. Sizes of facilities needed for specific farming enterprises are determined from research or other recommendations.
2. Amount of space required per unit of livestock and poultry and per unit volume of crops is determined.

SUBJECT AREA: Planning Farm Buildings and Structures

**TASK # 0191:** Determine whether permanent or temporary structures should be constructed.

**COMPETENCY:** Determine whether temporary or permanent buildings are more beneficial for farming programs.

**CRITERION MEASURE:**

1. Advantages and disadvantages of temporary and permanent structures are correctly listed.
2. Costs of temporary structures versus permanent structures for specific needs are calculated.
3. Goals of farming situations are evaluated in terms of having temporary or permanent facilities.
4. Requirements of the present farming program and future needs are evaluated.
5. Appropriate recommendations are made concerning temporary and permanent buildings for specific farming operations.

**TASK # 0192:** Determine whether single or multiple purpose buildings are needed.

**COMPETENCY:** Determine whether single purpose or multiple purpose buildings will be most beneficial and economical for farming operations.

**CRITERION MEASURE:**

1. The advantages and disadvantages of single purpose and multipurpose buildings are listed.
2. Costs of single purpose and multipurpose buildings are calculated and evaluated in terms of use for farming operations.
3. Current and future needs for types of buildings are correctly determined.
4. Appropriate recommendations are made concerning whether single purpose or multipurpose buildings are most beneficial and economical for specific farming operations.

SUBJECT AREA: Planning Farm Buildings and Structures

**TASK # 0193:** Determine whether to remodel or replace current buildings and structures.

**COMPETENCY:** Determine whether to remodel or replace the buildings and structures that are currently used on farms.

**CRITERION MEASURE:**

1. The advantages and disadvantages of remodeling and replacing buildings and structures are correctly listed.
2. The costs of remodeling and replacing buildings are calculated and compared.
3. The needs of the present farming situation and future demands are identified in terms of buildings.
4. Tax factors are identified for remodeling versus replacing.
5. Appropriate recommendations are made concerning remodeling versus replacing buildings taking into consideration all the factors that apply.

**TASK # 0194:** Determine where to locate buildings and structures.

**COMPETENCY:** Determine the location of building and structures to maximize efficiency on farms.

**CRITERION MEASURE:**

1. Factors that make location of buildings and structures desirable are correctly listed and discussed.
2. Legal and safety factors pertaining to location of buildings and structures are listed.
3. A farm layout is developed that shows travel of machines, animals, man, and other farm vehicles.
4. Appropriate recommendations are made for locating buildings and structures on specific farms given specific factors and conditions.

## SUBJECT AREA: Planning Farm Buildings and Structures

**TASK # 0195:** Estimate future building and structures needs.

**COMPETENCY:** Estimate the building and structure needs that will facilitate the plans for future farm enterprises.

**CRITERION MEASURE:**

1. The factors to consider in estimating future building and structure needs for farm enterprises are correctly listed.
2. Case studies of farms are evaluated and appropriate recommendations are made for estimating future building and structure needs.

**TASK # 0196:** Evaluate advantages and disadvantages of specific kinds and types of buildings and structures.

**COMPETENCY:** Evaluate the specific advantages and disadvantages of various kinds and types of buildings and structures that are used on the farm.

**CRITERION MEASURE:**

1. The costs of specific kinds and types of buildings and structures that are used on the farm are correctly determined.
2. The durability of various kinds and types of buildings and structures are determined and evaluated.
3. Usefulness of the various kinds and types of buildings and structures are determined.
4. Maintenance, upkeep, ease of repair, and versatility of buildings and structures are determined and evaluated.
5. Appropriate literature is obtained, read, and interpreted to assist in determining the advantages and disadvantages of specific buildings and structures used on the farm.

**TASK # 0197:** Identify building repairs needed.

**COMPETENCY:** Identify specific buildings repairs that are needed on the farm.

**CRITERION MEASURE:**

1. Factors to look for in identifying needed buildings repairs are listed.
2. Buildings are inspected and specific building repairs are correctly identified.

**TASK # 0198:** Select type of building materials to be used.

**COMPETENCY:** Select the type of building materials to be used in building, remodeling or repairing farm buildings and structures.

**CRITERION MEASURE:**

1. Various grades of building materials are listed and requirements are described.
2. Building code specifications concerning specific types of buildings and structures are identified.
3. Costs of various types of building materials are determined and compared with the needs of the structure.
4. Types of building materials are recommended that are economical and yet meet the needs of the facility.

**TASK # 0199:** Work with others in designing and planning buildings and structures.

**COMPETENCY:** Work with architects, agriculture extension personnel, Farmers Home Administration personnel and others in designing and planning buildings and structures that will be used in farm programs.

**CRITERION MEASURE:**

1. Individuals, companies, and agencies that offer assistance in planning and designing farm buildings are correctly determined.
2. Appropriate methods of contacting individuals that may assist in planning and designing farm buildings are listed and appropriate contacts are made.
3. Relationships with individuals that can offer assistance with farm building planning are congenial, helpful, and supporting.
4. Information requested by individuals that can assist in planning farm buildings is provided as needed and in a reasonable amount of time.
5. Prompt payment is made for services rendered if costs are involved.

SUBJECT AREA: Planning Farm Buildings and Structures

**TASK # 0200:** Select mechanical systems for use in buildings.

**COMPETENCY:** Determine the mechanical systems that are needed for use in buildings and select the systems that best meet the needs of specific farming operations.

**CRITERION MEASURE:**

1. Farm enterprises are evaluated and needed mechanical systems are determined that will increase efficiency and increase profits.
2. Types of needed mechanical systems are identified and advantages and disadvantages of each type are determined.
3. The needs of the farming operations are compared with the different types of systems available.
4. Recommended types of mechanical systems are selected after comparing all the factors necessary to make intelligent choices.
5. Mechanical systems are chosen that are efficient and cost effective.

SUBJECT AREA: Planning the Farm Equipment and Machinery Program

TASK # P201: Calculate equipment operation costs.

COMPETENCY: Calculate the costs of operating various types of farm machinery for specified periods of time and for particular operations.

CRITERION MEASURE:

1. Fuel, labor, depreciation, maintenance, and repair costs are calculated for operating specified types of machinery for specified periods of time and for specified operations.
2. All costs are recorded on appropriate forms for easy reference.

TASK # P202: Determine current condition of machinery and equipment.

COMPETENCY:

1. Visually inspect equipment and machinery to determine their condition.
2. Test equipment and machinery to determine their current condition.

CRITERION MEASURE:

1. The signs to look for when inspecting machinery and equipment are correctly listed.
2. Machinery and equipment are inspected and worn, rusted, cracked, oil leaks, and other conditions are correctly identified.
3. Compression and other common tests are correctly run on machinery and equipment and test results are interpreted correctly.
4. Machinery and equipment are field tested and improperly functioning engines and parts are correctly identified.

TASK # P203: Determine size of machinery and equipment to purchase.

COMPETENCY: Determine the size of machinery and equipment to purchase for the farming program that is to be implemented.

CRITERION MEASURE:

1. Economies of size of machinery and equipment in relation to the farming program is adequately explained.
2. Recommended size of machinery and equipment to purchase is adequate for the jobs to be performed on the farm and is economically justifiable.

**TASK # P204:** Determine what machinery and equipment is needed.

**COMPETENCY:** Determine the type and amount of machinery and equipment needed for the desired farm program.

**CRITERION MEASURE:**

1. The advantages and disadvantages of the various types of equipment and machinery are correctly determined and evaluated in terms of the farming needs.
2. The type and amount of equipment and machinery recommended for the farming program is economically feasible and increases production and efficiency to justify purchasing.

**TASK # P205:** Determine whether to do custom work for others.

**COMPETENCY:** Determine whether or not it would be economical and otherwise feasible to do custom work for others.

**CRITERION MEASURE:**

1. Total costs, total returns, and profits or losses are correctly computed when estimating feasibility of doing custom work for others.
2. Advantages and disadvantages of doing custom work are correctly listed and discussed.
3. Recommendations on doing custom work for others are realistic in terms of economics, time available, and other advantages and disadvantages.

**TASK # P206:** Determine whether to own machinery or lease it.

**COMPETENCY:** Determine whether it is more feasible to own or lease machinery.

**CRITERION MEASURE:**

1. The costs and returns involved in owning and leasing machinery are correctly calculated.
2. The advantages and disadvantages of owning and leasing machinery are correctly listed.
3. Recommendations on whether to own or lease machinery are realistic in terms of economics and other pertinent factors.

SUBJECT AREA: Planning the Farm Equipment and Machinery Program

**TASK # P207:** Determine whether to own equipment needed or hire custom work done.

**COMPETENCY:** Determine whether it is most feasible to own equipment or hire custom work to perform jobs.

**CRITERION MEASURE:**

1. Ownership costs for machinery are correctly determined for specified jobs.
2. Custom work costs for specified jobs are correctly estimated.
3. Advantages and disadvantages of machinery ownership versus custom hire are correctly listed.
4. Recommendations for machinery ownership versus custom hire are realistic in terms of economics and other important factors.

**TASK # P208:** Determine whether to repair equipment or hire work done.

**COMPETENCY:** Determine whether it is more feasible to self repair equipment or hire the work done.

**CRITERION MEASURE:**

1. The factors that are important in making a decision concerning self repairing equipment or hiring it done are correctly listed.
2. Costs involved in self repair work versus hiring repair work done are correctly computed.
3. Advantages and disadvantages of self repair versus custom repair are correctly listed and discussed.
4. Recommendations on whether to self repair equipment or hire repair work done are realistic in terms of economic, time, ability, and other factors.

SUBJECT AREA: Planning the Farm Equipment and Machinery Program

**TASK # P209:** Determine whether to repair or trade in equipment and machinery.

**COMPETENCY:** Determine whether it would be more feasible to trade in equipment and machinery or repair it.

**CRITERION MEASURE:**

1. The cost of repairs on specified equipment is determined.
2. The cost of new machinery to replace the used machinery is determined.
3. The useful years of life remaining on the used equipment versus the expected useful years of life on new equipment is determined.
4. Estimated expenses on the upkeep of the used versus the new equipment are calculated.
5. Advantages and disadvantages of repairing used equipment versus buying new equipment are correctly listed.
6. Recommendations on whether to trade in equipment and machinery versus repairing it are realistic in terms of particular situations and the factors involved.

**TASK # P210:** Determine whether to purchase new or used equipment.

**COMPETENCY:** Determine whether it would be more feasible to buy new or used equipment.

**CRITERION MEASURE:**

1. The factors to consider on whether to buy new or used equipment are correctly listed.
2. Advantages and disadvantages of buying new versus used equipment are correctly listed and discussed.
3. The economies of buying used or new equipment are correctly determined.
4. Recommendations on buying new or used equipment are realistic based on the farming situations and the various factors involved.

**TASK # P211:** Determine returns expected from machinery and machinery investments.

**COMPETENCY:** Determine the returns that can be expected by investing in equipment and machinery.

**CRITERION MEASURE:** The returns that can be expected from investing in machinery and equipment are correctly determined and discussed.

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| TASK # P212: | Develop regular equipment and machinery maintenance schedules. |
| COMPETENCY: | Develop schedules for the regular maintenance of the equipment and machinery used on the farm. |
| CRITERION MEASURE: | 1. Equipment and machinery maintenance schedules are developed and follow recommended schedules of the manufacturers.<br>2. Equipment and machinery maintenance schedules take into consideration special operating conditions under which the equipment and machinery are exposed. |

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| TASK # P213: | Evaluate the advantages and disadvantages of specific types and brands of equipment and machinery. |
| COMPETENCY: | Evaluate the advantages and disadvantages of specific types and brands of equipment and machinery as they pertain to individual farm programs. |
| CRITERION MEASURE: | 1. Where to obtain information on specific types and brands of equipment and machinery is correctly determined.<br>2. The advantages and disadvantages of specific types and brands of equipment and machinery for specific situations are listed and discussed. |

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| TASK # P214: | Evaluate the possibility of joint ownership of equipment and machinery. |
| COMPETENCY: | Evaluate the pros and cons of owning equipment and machinery jointly with another individual or individuals. |
| CRITERION MEASURE: | 1. The advantages and disadvantages of single versus joint ownership of machinery and equipment are correctly listed and discussed.<br>2. The economies of single ownership versus joint ownership of machinery and equipment are correctly determined. |

**TASK # P215:** Identify equipment repairs needed.

**COMPETENCY:** Identify repairs that are necessary for the equipment and machinery to operate efficiently.

**CRITERION MEASURE:**

1. Equipment is visually inspected and tested and potential problems are detected.
2. Symptoms of malfunctioning of machinery and equipment are identified.
3. The types of equipment and machinery repairs needed are correctly provided.

**TASK # P216:** Identify ways to reduce equipment and machinery costs.

**COMPETENCY:** Identify methods of reducing purchase and operating costs of equipment and machinery.

**CRITERION MEASURE:**

1. Methods of reducing purchase and operating costs of machinery and equipment are correctly listed and discussed.
2. Machinery and equipment is maintained according to recommended schedules and repairs are made as needed.
3. Equipment and machinery is operated according to recommendations without overloading.

SUBJECT AREA: Planning the Livestock Program

TASK # Q217: Determine the amount of feed to be purchased in addition to homegrown feeds.

COMPETENCY: Determine the amount of feed to be purchased in addition to home grown feeds over a specified period of time for a specified number of livestock.

CRITERION MEASURE:

1. The amount of home grown feed is measured accurately.
2. The total amount of feed needed for the livestock enterprise over a specified period of time is calculated.
3. The amount of feed to be purchased is calculated accurately.

TASK # Q218: Determine resources needed for livestock program.

COMPETENCY: Determine resources needed for a specified size of beef cattle and dairy herd.

CRITERION MEASURE:

1. Correct numbers of cattle, land, equipment, cash on hand, feeds, labor, and other assets are accurately determined.
2. Current liabilities are accurately determined.
3. Operational costs are accurately determined.
4. Resource materials are accurately used to determine amounts of land, labor, capital, etc. needed for the specified size of operation.
5. Increased or decreased resources are determined to make the enterprise more efficient.

TASK # Q219: Determine the amount of livestock for the farm.

COMPETENCY: Analyze resources and determine the amount and types of livestock for the farming operation.

CRITERION MEASURE:

1. The factors to consider in determining the amount and types of livestock for the farming operation are listed and discussed.
2. Appropriate recommendations are made for the amount and types of livestock for the farming operation after considering the resources needed for each livestock enterprise.

**TASK # Q220:** Determine the grade of livestock for the farm.

**COMPETENCY:**

1. Identify the requirements of producing different grades of livestock for the farming operation.
2. Recommend the grade of livestock to be produced after considering the grade requirements and the purposes of the specific operation.

**CRITERION MEASURE:**

1. The requirements for producing different grades of livestock are correctly listed.
2. The resources needed for producing different grades of livestock are provided.
3. An analysis of the current farming situation is made and outlined.
4. Appropriate recommendations are made concerning the production of specific grades of livestock considering the many factors involved in the decision.

**TASK # Q221:** Determine whether to expand or contract the livestock enterprises.

**COMPETENCY:** Analyze the market situation, price trends, resources on hand and needed, and other factors and decide whether to expand or contract specific livestock enterprises.

**CRITERION MEASURE:**

1. The factors to consider in determining whether to expand or contract the livestock enterprises in particular farming situations are listed and discussed.
2. Appropriate recommendations are made concerning expanding or contracting livestock enterprises after evaluating the factors and correctly completing enterprise budgets.

SUBJECT AREA: Planning the Livestock Program

TASK # Q222: Develop livestock planning budgets.

COMPETENCY:

1. Keep accurate records of expenses and receipts for livestock enterprises.
2. Obtain accurate information on tax laws and tax shelters.
3. Analyze records and calculate rates of return on livestock enterprises.
4. Develop yearly planning budgets for livestock enterprises using past records and other planning information available.

CRITERION MEASURE:

1. The requirements for making livestock planning budgets are listed and discussed.
2. Accurate production, expense, and receipt records are kept on appropriate forms.
3. Rates of return on livestock enterprises are calculated correctly.
4. Recommended yearly planning budgets are accurately developed using the necessary resources to develop budgets.

TASK # Q223: Establish livestock enterprise production goals.

COMPETENCY: Analyze resources, family needs and goals, price trends, and other factors to establish livestock enterprise production goals.

CRITERION MEASURE:

1. The factors or requirements needed to establish livestock enterprise production goals are provided and discussed.
2. Appropriate recommendations are made for livestock enterprise production goals after considering the many factors involved in making the decisions.

## SUBJECT AREA: Planning the Livestock Program

**TASK # Q224:** Identify livestock resources available for livestock.

**COMPETENCY:** Identify livestock resources available on the farm for different livestock enterprises.

**CRITERION MEASURE:**

1. An inventory of physical resources available for different livestock enterprises on the farm is accurately taken.
2. Labor, management, and capital resources available for different livestock enterprises are correctly identified.

**TASK # Q225:** Identify special production practices needed to attain production goals.

**COMPETENCY:** Determine special production practices needed to attain livestock production goals by studying past and current production practices, obtaining information and advice from agricultural agency personnel, reading farm magazines and special reports, etc.

**CRITERION MEASURE:**

1. Past and current production practices are determined and listed.
2. Information is obtained from knowledgeable individuals and written sources and information is applied to the livestock operation.
3. From information obtained and analysis made, special production practices are identified, used, and production goals reached.

**TASK # Q226:** Identify ways to increase the efficiency of livestock programs.

**COMPETENCY:** List factors that contribute to increasing the efficiency of livestock programs by consulting appropriate resources.

**CRITERION MEASURE:**

1. Sources of information that may be used to obtain ideas about increasing the efficiency of livestock programs are correctly listed.
2. Factors that contribute to increasing the efficiency of livestock programs are listed.

SUBJECT AREA: Planning the Livestock Program

**TASK # Q227:** Determine the type of livestock for the farm.

**COMPETENCY:** Analyze past production records, enterprise budgets, current resources, production goals, price trends, and other factors to determine livestock enterprises for the farm.

**CRITERION MEASURE:**

1. Factors that must be examined to assist in determining the type of livestock for the farm are correctly listed.
2. Production records, resources available, price trends, and other factors are correctly analyzed to assist in making decisions on what livestock should be grown.
3. Appropriate recommendations are made on the types of livestock to be grown based on all available information.

**TASK # Q228:** Develop livestock budget.

**COMPETENCY:** Develop annual livestock budgets by keeping accurate annual records of all receipts and expenses and being knowledgeable of prices and price trends.

**CRITERION MEASURE:**

1. An adequate record system is developed and properly used.
2. An annual budget is developed for each livestock enterprise based on an analysis of the records, price trends, and other factors.

## SUBJECT AREA: Planning the Crop Program

TASK # R229: Determine amount of crops to be grown.

COMPETENCY: Analyze past production records, budgets, current resources, and production goals to determine number of acres of crops to be grown.

CRITERION MEASURE:

1. Past production records and budgets are analyzed correctly to determine crops grown, production record, and profits or losses for each crop enterprise.
2. Current resources and production goals are properly examined to project the amount of crops to be grown.

TASK # R230: Determine crop enterprises for the farm.

COMPETENCY: Analyze past production records, enterprise budgets, current resources, and production goals to determine crop enterprises for the farm.

CRITERION MEASURE:

1. Past production records and enterprise budgets are analyzed correctly to determine crop enterprises that have been profitable.
2. Current resources and production goals are properly examined.
3. Crop enterprises to be grown are listed based on correct analysis of past records, budgets, current resources, production goals, and outlooks for specific crops provided by outside resources.

TASK # R231: Determine crop rotations to be followed.

COMPETENCY: Analyze production records, examine production goals, and analyze crop rotation recommendations from reliable sources to determine crop rotations for the farm.

CRITERION MEASURE:

1. Production records are correctly analyzed.
2. Production goals are properly examined to project types and amounts of crops to be grown.
3. Crop rotation recommendations are obtained from agricultural extension agents, the state experiment station, farm newsletters and magazines and other reliable sources and objective analyses are made.

SUBJECT AREA: Planning the Crop Program

**TASK # R232:** Determine whether to expand or contract crop enterprises.

**COMPETENCY:** Examine past production records, enterprise budgets, current resources and production goals to determine whether to expand or contract crop enterprises.

**CRITERION MEASURE:**

1. Past production records and enterprise budgets are analyzed correctly to determine profits and losses for crop enterprises.
2. Current resources and production goals are properly examined.
3. Crop enterprise expansion or contraction decisions are made based on objective analysis of all information available.

**TASK # R233:** Develop crop budgets.

**COMPETENCY:** Develop crop budgets by keeping accurate annual records of all receipts and expenses, including labor, tractor and other equipment, use depreciation, taxes, etc. for each crop.

**CRITERION MEASURE:**

1. An adequate record system is developed and properly used.
2. A budget is developed for each crop enterprise based on the correct use of the records.

**TASK # R234:** Develop crop production schedule for farm.

**COMPETENCY:**

1. Develop a record system to record dates of each operation for each crop enterprise.
2. Develop a crop production schedule for each crop enterprise based on the correct use of the records.

**CRITERION MEASURE:**

1. An adequate record system is developed to record dates of each operation for each crop enterprise.
2. Accurate crop production schedules are developed from the records.

TASK # R235: Establish crop production goals.

COMPETENCY: Establish crop production goals on a one, three, and five year schedule using past production records, enterprise budgets, resources, crop forecasts, crop allotments, and other available sources of information.

CRITERION MEASURE:

1. Past production records and enterprise budgets are correctly analyzed to determine production and profits or losses.
2. Current resources, crop forecasts, crop allotments, and other crop information are examined to make reasonable projections.
3. Reasonable crop production goals are established on a one, three, and five year schedule.

TASK # R236: Identify resources available for crop program.

COMPETENCY: Identify resources available for the crop program by analyzing past production records and taking an inventory of facilities, equipment, land, labor, management, and capital available.

CRITERION MEASURE:

1. Past production records are analyzed correctly to determine resources used.
2. Current resources are correctly determined by taking an inventory of facilities, equipment, land, labor management, and capital.

TASK # R237: Identify special production practices needed to attain production goals.

COMPETENCY: Determine special production practices needed to attain production goals by studying past and current production practices, obtaining information and advice from agricultural agency personnel, reading farm magazines and special reports, etc.

CRITERION MEASURE:

1. Past and current production practices are determined and listed.
2. Information is obtained from individuals and written sources and is applied to the farming situation.
3. From the analysis made, special production practices are identified, used, and production goals reached.

SUBJECT AREA: Planning the Crop Program

TASK # R238: Identify ways to increase crop efficiency.

COMPETENCY: List factors that contribute to increasing crop production, i.e., providing supplemental water at correct time, placement of fertilizer, etc.

CRITERION MEASURE: Factors that contribute to increasing crop production are listed correctly.

TASK # R239: Identify resources needed for the crop program.

COMPETENCY: List the resources and the approximate amount of each resource needed to produce a quality crop program.

CRITERION MEASURE:

1. Sources of information concerning resources are determined.
2. Resources needed to produce a quality crop program are listed.

TASK # R240: Plan field layout.

COMPETENCY: Plan field layout to meet specifications for irrigation, strip cropping, terracing, specialized crops such as tobacco and truck crops, erosion control by correct placing of rows, etc.

CRITERION MEASURE: Field layout is correctly planned to meet specified criteria for irrigation, strip cropping, terracing, growing specialized crops, erosion control, etc.

## SUBJECT AREA: Financing the Farm Business

**TASK # S241:** Calculate amounts of interest owed on borrowed money.

**COMPETENCY:** Calculate amounts of interest to be paid on specified amounts of money borrowed over specified periods of time.

**CRITERION MEASURE:** Amounts of interest to be paid on specified amounts of money borrowed over specified periods of time are correctly calculated.

**TASK # S242:** Determine amount of credit needed.

**COMPETENCY:** Determine the amount of credit needed to operate the farm business for a specified period of time.

**CRITERION MEASURE:**

1. Amount of cash reserves and accounts receivable available for the farm business is correctly determined.
2. Total amount of capital needed to operate the farm business for a specified period of time is correctly determined.
3. The amount of credit needed above cash reserves and accounts receivable is correctly determined.

**TASK # S243:** Determine length of loan needed.

**COMPETENCY:**

1. Determine time required for production of specific enterprise.
2. Determine if loan is needed for part or all of production time.
3. Determine when repayment can be made.
4. Determine the length of the loan needed by analyzing the factors affecting loan length.

**CRITERION MEASURE:**

1. The factors related to determining the length of loans needed for the farm are correctly listed.
2. Loan lengths are compatible with the enterprises for which borrowed.
3. Appropriate loan lengths are recommended that are in line with production schedules and other reliable factors.

SUBJECT AREA: Financing the Farm Business

**TASK # S244:** Develop budget to determine if it will pay to borrow money.

**COMPETENCY:**

1. Calculate predicted costs and returns using marketing projections and futures as return guides.
2. Keep accurate records of all costs and returns.
3. Compare projected returns from possible increased production as a result of increased funding through borrowing money versus possible lower returns from not having the extra cash resources available.

**CRITERION MEASURE:**

1. All budgeted items are realistic in terms of items included, prices, and projected returns.
2. Projected returns are calculated accurately when company borrowing money versus not having the extra funds available for increased resources.

**TASK # S245:** Develop debt repayment schedule.

**COMPETENCY:**

1. Develop a schedule of projected returns for the farm enterprises.
2. Develop a schedule of fixed payments and operational payments.
3. Develop a debt repayment schedule based on projected returns and fixed and operational expenses.

**CRITERION MEASURE:**

1. All figures used in developing schedules are realistic.
2. An appropriate debt repayment schedule is recommended that is within the ability to repay the debt based on projected costs and returns.

**TASK # S246:** Develop overall credit plan needed for farm.

**COMPETENCY:**

1. Develop overall costs for all enterprises.
2. Develop projected return schedule for enterprises.
3. Develop seasonal use of money for all enterprises.
4. Develop plans for expanding or reducing enterprises.
5. Analyze costs, returns, and future projections and develop a credit plan needed for the farm.

**CRITERION MEASURE:**

1. All budgeting is completed on appropriate forms.
2. Cost and return figures are realistic and are quoted from reliable sources.
3. The recommended credit plan is well formulated, shows extensive preplanning, and is realistic and workable.

## SUBJECT AREA: Financing the Farm Business

TASK # S247: Evaluate importance of good credit ratings.

COMPETENCY:
1. Provide the reasons for developing and maintaining good credit ratings.
2. List the factors that contribute to a good credit rating.

CRITERION MEASURE:
1. The reasons for developing and maintaining good credit ratings are correctly listed and discussed.
2. The factors that contribute to a good credit rating are correctly listed.

TASK # S248: Evaluate interest terms on loans.

COMPETENCY: Determine interest terms on loans and compare interest rates.

CRITERION MEASURE:
1. Interest rates on loans are correctly determined and compared.
2. Repayment schedules of different loans are correctly determined.
3. Loan restrictions and other specifications are correctly determined and explained.

TASK # S249: Evaluate loan repayment terms and conditions.

COMPETENCY: Determine loan repayment terms and conditions and compare loan terms and conditions.

CRITERION MEASURE: Loan repayment terms and conditions are correctly determined and compared with other loans.

SUBJECT AREA: Financing the Farm Business

**TASK # S250:** Evaluate repayment capacity.

**COMPETENCY:**

1. Develop farm enterprise budgets to determine expected returns on investments.
2. Determine loan repayment capacity by evaluating enterprise budgets.

**CRITERION MEASURE:**

1. Appropriate enterprise budgets are developed.
2. Appropriate loan repayment capacities are determined.

**TASK # S251:** Identify and evaluate various sources of credit.

**COMPETENCY:**

1. Obtain names of lending agencies.
2. Determine characteristics of lending agencies.
3. Determine type of agencies that will fit farm needs.
4. Determine credibility of lending agencies from appropriate references.

**CRITERION MEASURE:**

1. Names of lending agencies are listed.
2. Characteristics of lending agencies are determined.
3. Types of agencies that have possible loans that will fit farm needs are determined.
4. Credibility of lending agencies are determined from appropriate references.

**TASK # S252:** Identify factors which influence credit ratings.

**COMPETENCY:** Determine the factors that influence the development of good and bad credit ratings.

**CRITERION MEASURE:** The factors that influence credit ratings are correctly listed and discussed.

## SUBJECT AREA: Financing the Farm Business

**TASK # S253:** Identify purposes for which credit is needed.

**COMPETENCY:** Identify purposes for which credit is needed by analyzing enterprise budgets and projected expansion projects.

**CRITERION MEASURE:** Enterprise budgets are correctly analyzed to determine purposes for which credit is needed.

**TASK # S254:** Identify the credit strengths and weaknesses of the farm business.

**COMPETENCY:**

1. Determine the enterprises that are profitable and those that are nonprofitable.
2. Determine the returns to investment of farm enterprises.

**CRITERION MEASURE:** Enterprise budgets are correctly evaluated and credit strengths and weaknesses of the total farm are determined.

**TASK # T255:** Determine amount of capital available for securing land.

**COMPETENCY:**

1. Analyze enterprise budgets to determine projected returns.
2. Analyze the farm financial statement to determine the assets on hand.
3. Develop a total farm budget to determine capital available for securing land.

**CRITERION MEASURE:**

1. Enterprise budgets are correctly analyzed to determine projected returns on investments.
2. Farm financial statements are correctly analyzed to determine assets on hand.
3. The capital available for securing land is realistically projected from the development of a total farm budget.

**TASK # T256:** Determine the amount of land needed.

**COMPETENCY:** Estimate the amount of land needed for specified rates of return on various farm enterprises.

**CRITERION MEASURE:**

1. Production schedules and prices for products produced are accurately estimated.
2. The number of acres of land needed for various enterprises for specified rates of return is realistic.

**TASK # T257:** Determine if land available fits the future farm plan.

**COMPETENCY:**

1. Plan the farm expansion program.
2. Determine land needed for each enterprise.
3. Determine land presently available.
4. Analyze land needs versus land presently available and make an accurate determination of available land to meet the future farm plan.

**CRITERION MEASURE:**

1. Land needs for farm enterprises are accurately projected.
2. Available land is analyzed and an accurate determination is made of its suitability to meet the projected farm plan.

## SUBJECT AREA: Securing Land

**TASK # T258:** Determine the type of farm and land needed.

**COMPETENCY:** Determine the type of land needed for specified farm enterprises.

**CRITERION MEASURE:** Land requirements for specified farm enterprises are accurately listed and discussed.

**TASK # T259:** Determine when to buy land.

**COMPETENCY:** Analyze market trends and prices and estimate the most economical time to buy land.

**CRITERION MEASURE:**

1. Land values and prices are accurately determined.
2. Recommendations on when to buy land are accurately made.

**TASK # T260:** Determine whether to buy, rent, or lease land.

**COMPETENCY:**

1. List the factors that influence whether to rent, buy, or lease land.
2. Develop cost and return data on buying, renting, and leasing land for specified enterprises and make recommendations based on an analysis of the data.

**CRITERION MEASURE:**

1. The factors that influence whether to rent, buy, or lease land are correctly listed and discussed.
2. Cost and return data on renting, buying, and leasing land is correctly computed using reliable price and cost data.
3. Recommendations on whether to buy, rent, or lease land are made on an accurate analysis of the data.

**TASK # T261:** Evaluate land price cycles.

**COMPETENCY:** Determine price cycles for land and causes of the cycles.

**CRITERION MEASURE:**

1. Land price cycles are accurately determined.
2. Causes of land price cycles are correctly listed and discussed.

**TASK # T262:** Evaluate lease and rental agreements.

**COMPETENCY:** Determine the provisions of lease and rental agreements and select the agreements that best fit the specified farming situation.

**CRITERION MEASURE:**

1. The provisions of lease and rental agreements are read, properly interpreted, and explained or discussed.
2. Specified farming situations are analyzed and lease and rental agreements are selected that best fit the operations.

**TASK # T263:** Identify available land.

**COMPETENCY:** Identify land that is available and is potentially suitable for specified farming operations.

**CRITERION MEASURE:**

1. Sources of information on land availability are correctly listed and discussed.
2. Land that is potentially suitable for specified farming operations is identified and proper selections are made.

**TASK # T264:** Identify factors that will influence utilization of available land.

**COMPETENCY:** Identify and explain factors that influence utilization of available land for farming purposes.

**CRITERION MEASURE:** Factors that influence utilization of available land for farming purposes are listed and properly interpreted.

TASK # T265: Make an appraisal of the land and buildings.

COMPETENCY: Appraise land and buildings based on their productive value using current market prices.

CRITERION MEASURE:

1. Land and buildings are accurately appraised.
2. Factors affecting values of land and buildings are stated and discussed.

SUBJECT AREA: Constructing and Maintaining Buildings and Structures

TASK # U266: Apply wood and metal preservatives.

COMPETENCY:

1. Apply wood preservatives to lumber and timbers to prevent decomposition by rotting or insect infestation.
2. Apply preservatives to metal to prevent break down by rusting or weathering.

CRITERION MEASURE:

1. Wood and metal preservative materials are listed and characteristics are described.
2. Reasons for applying preservative materials are listed.
3. Effects of preservative materials on wood and metal are described.
4. Wood and metal preservatives are applied correctly using various methods.

TASK # U267: Clean and oil electric motors on structures.

COMPETENCY: Perform routine maintenance on electric motors such as cleaning and oiling.

CRITERION MEASURE:

1. Reasons for periodic maintenance of electric motors are correctly listed.
2. Cleaning and oiling materials are listed and are properly used.
3. Electric motors are cleaned and oiled following manufacturer's recommendations.

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| TASK # U268: | Build and remove concrete forms. |
| COMPETENCY: | 1. Build forms for pouring concrete capable of withstanding weight and pressure.<br>2. Dismantle forms properly and without damage to concrete work after curing. |
| CRITERION MEASURE: | 1. Area is properly smoothed, leveled, and laid out to construct forms.<br>2. Forms are built to specified dimensions.<br>3. Reinforcement braces are correctly located.<br>4. Materials used next to concrete are of smooth finish so as to leave concrete smooth.<br>5. Forms are disassembled without cracking or chipping cured concrete.<br>6. Batter boards are properly removed leaving the finished concrete smooth. |

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| TASK # U269: | Determine cost of repairs. |
| COMPETENCY: | Determine cost of repair work to buildings and structures. |
| CRITERION MEASURE: | 1. Approximate cost of materials for repairing specified damage to buildings is provided.<br>2. Labor cost for repairing specified damage is accurately estimated.<br>3. Costs besides labor and materials are provided for repairs to buildings.<br>4. Total estimated costs for repairs to buildings and other structures are estimated to within 5% of the actual cost. |

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| TASK # U270: | Develop bill of materials needed for repairs. |
| COMPETENCY: | List the type and amount of materials needed for specified repair work to buildings and other structures. |
| CRITERION MEASURE: | A bill of materials for specified repairs is properly and correctly developed and is provided in the correct format. |

TASK # U271: Repair and hang gates and doors.

COMPETENCY:
1. Repair damaged doors and gates by replacing worn parts.
2. Hang doors and gates so as to be free swinging and easily opened or closed.

CRITERION MEASURE:
1. Doors and gates are correctly repaired using appropriate tools efficiently and safely.
2. Doors and gates are hung following recommended procedures.
3. After being hung, doors and gates fit the opening, are properly aligned for free swing, and open and close without binding.

TASK # U272: Install electric motors.

COMPETENCY: Install electric motors by wiring to power source and connecting pulleys and drives to equipment.

CRITERION MEASURE:
1. Wiring diagrams are correctly read and wiring codes are listed.
2. Motors are securely installed and wiring is properly connected to power source.
3. Pulleys and drives are properly connected.
4. All safety precautions are observed.

TASK # U273: Lay blocks and bricks.

COMPETENCY:
1. Lay blocks for foundations, walls, or partitions for buildings.
2. Lay bricks for finished walls and walks.

CRITERION MEASURE:
1. Procedures for properly laying blocks and bricks are followed.
2. Block and brick work is level, straight, and the specified dimensions are obtained.
3. Outerside of masonry work is properly cleaned.

TASK # U274: Mix, pour, finish, and cure concrete.

COMPETENCY:

1. Mix concrete in mixer in proportionate amounts of lime, sand, and water.
2. Pour, smoothly finish, and cure concrete for durability.

CRITERION MEASURE:

1. Concrete is mixed according to recommendations.
2. Concrete is poured, finished, and cured according to standard procedures.

TASK # U275: Read and interpret blueprints.

COMPETENCY:

1. Read blueprints and understand technical terms and meanings.
2. Interpret the meaning of symbols, dimensions, and structural erections.

CRITERION MEASURE:

1. Blueprints are read and interpreted correctly.
2. Symbols, dimensions, and structural erections are correctly interpreted.

TASK # U276: Install and repair bracing in buildings and structures.

COMPETENCY:

1. Install bracing in buildings for structural support.
2. Repair damaged bracing in buildings and structures as needed.

CRITERION MEASURE:

1. Bracing is analyzed to determine when it should be repaired or replaced.
2. Angles of support are correctly determined and bracing is cut to specified angles.
3. Bracing is repaired and replaced following recommended procedures.
4. Installed bracing is adequate for building support.

**TASK # U277:** Repair electrical cords and broken wires.

**COMPETENCY:**

1. Repair cords and wires to prevent hazards.
2. Make repaired connections to conform to electrical standards.

**CRITERION MEASURE:**

1. Electrical cords and broken wires are correctly repaired as needed.
2. Repairs are made to wires and cords according to electrical codes.
3. Tools are used correctly.
4. All safety precautions are observed.

**TASK # U278:** Repair minor leaks in roof of buildings.

**COMPETENCY:**

1. Recognize the source of leaks and extent to buildings.
2. Apply repair materials as recommended by the manufacturer.

**CRITERION MEASURE:**

1. Effects of leaks on the life of structures and damage to contents are described.
2. Roof repair materials are listed and characteristics described.
3. Sources of leaks are determined.
4. Removal and replacement of damaged parts are completed following recommended procedures.
5. Roofs do not leak after repair.

**TASK # U279:** Replace belts and pulleys.

**COMPETENCY:**

1. Replace worn belts and pulleys as needed for proper equipment operation.
2. Replace belts and pulleys as indicated by routine equipment maintenance.

**CRITERION MEASURE:**

1. Worn and damaged belts and pulleys are correctly identified.
2. Belts and pulleys are correctly removed from equipment without damaging other parts.
3. Belt lengths are correctly determined.
4. Belts and pulleys are replaced on equipment following recommended procedures.
5. Machinery operates properly after belts and pulleys are replaced.

**TASK # U280:** Reset circuit breakers.

**COMPETENCY:** Reset circuit breakers after electrical circuit has tripped the breaker.

**CRITERION MEASURE:**

1. Reasons for circuit breakers tripping are listed.
2. The circuit is properly checked for damage and overload before the breaker is reset.
3. Circuit breakers are correctly reset.
4. Electrical operation is resumed after reset.

**TASK # U281:** Replace electrical switches.

**COMPETENCY:** Replace electrical switches as needed after damage or wear.

**CRITERION MEASURE:**

1. Power source is disconnected before switches are replaced.
2. Electrical switches are removed by disconnecting wires and removing nails or screws.
3. Electrical switches are replaced by properly connecting wires and securing the switches.
4. Electrical circuits function correctly after switch replacement.
5. All safety precautions are observed.

**TASK # U282:** Replace fuses.

**COMPETENCY:** Replace electrical fuses after they have blown.

**CRITERION MEASURE:**

1. Location of fuses is determined.
2. Fuse sizes and numbering system are provided.
3. Reasons for blown fuses are listed.
4. Blown fuses are correctly identified.
5. Fuses are removed and replaced correctly and safely.
6. Equipment functions after fuse replacement.

**TASK # U283:** Replace lighting fixtures.

**COMPETENCY:** Replace light fixtures that have failed or become faulty or inadequate.

**CRITERION MEASURE:**

1. Reasons for light fixture failure are determined.
2. Principles of electrical wiring are described and illustrated.
3. Applicable electrical standards and codes are identified and described.
4. Light fixtures are removed, correctly repaired, and replaced correctly.
5. Lighting is proper and adequate after replacement.
6. All safety precautions are observed.

**TASK # U284:** Replace valves in water system.

**COMPETENCY:** Replace worn or damaged water valves in system as needed.

**CRITERION MEASURE:**

1. Functions of valves in water system are listed.
2. Basic plumbing techniques and procedures are demonstrated - cutting pipe, replacing joints, sealing pipes, etc.
3. Applicable building codes and standards related to plumbing are identified and demonstrated.
4. Valves are replaced in water system following appropriate procedures.
5. Water system functions adequately after replacement and no leaks are noted in pipes.

**TASK # U285:** Repair faucets.

**COMPETENCY:** Repair water faucets to eliminate leaks and correct those not functioning adequately.

**CRITERION MEASURE:**

1. Causes of improperly functioning faucets are identified.
2. Faucets are properly removed, parts inspected, defective parts replaced, and faucets reinstalled correctly.
3. Faucets function properly and without leaks.

SUBJECT AREA: Constructing and Maintaining Buildings and Structure

**TASK # U286:** Replace water pipe.

**COMPETENCY:** Replace old or unserviceable water pipe.

**CRITERION MEASURE:**

1. Types of pipe are correctly identified.
2. Repair procedures for the type of pipe used are followed correctly.
3. Basic plumbing skills are demonstrated.
4. Old pipes are properly cut and joints are installed correctly.
5. Replaced pipes do not leak and water system functions properly.

**TASK # U287:** Replace window panes.

**COMPETENCY:** Replace cracked or broken window panes.

**CRITERION MEASURE:**

1. Types of window panes used are correctly identified and panes are selected that are of the same type as the original panes.
2. Old panes are correctly removed without damaging framing or breaking other panes.
3. New panes are cut to the right dimensions.
4. New panes are installed correctly and caulked if needed to seal panes.

**TASK # U288:** Wire electrical circuits.

**COMPETENCY:** Wire electrical circuits in buildings and in power machinery.

**CRITERION MEASURE:**

1. Circuit or wiring diagrams are read and interpreted correctly.
2. Basic wiring skills are demonstrated - wire replacement, splicing, wrapping, pigtailing, etc.
3. Electrical codes and standards applicable to electrical circuits are followed.
4. Electrical circuits are wired following established procedures.
5. After wiring, circuits perform correctly.
6. All safety precautions are observed.

SUBJECT AREA: Constructing and Maintaining Buildings and Structures

TASK # U289: Construct and repair fences.

COMPETENCY: Construct new fences and repair existing fences.

CRITERION MEASURE:

1. Fencing materials are correctly identified.
2. Fencing materials are selected that meet the demands of the job.
3. Area for new fencing is laid out and type, amount, and cost of materials are determined.
4. Holes are bored using power machinery correctly and efficiently.
5. Fencing is installed using correct tools and equipment.
6. New fence construction is durable and adequate.
7. Fence repair materials needs are determined.
8. Tools and equipment needed to repair fences are selected.
9. Fence repairs are made following sound procedures.
10. All safety precautions are observed during fence construction and repair.

TASK # U290: Install and repair wood siding and panels on buildings and structures.

COMPETENCY: Install and repair wood siding and panels on buildings and structures.

CRITERION MEASURE:

1. Type, amount, and cost of wood siding and panels and other materials needed to repair and install new siding to buildings are correctly estimated.
2. All measurements are made accurately.
3. Power and hand tools needed are identified and used correctly.
4. Building codes applicable to the project are followed.
5. All safety precautions are observed.
6. Wood siding and panels are installed following recommended procedures.
7. Completed job is neat, attractive, and durable.

SUBJECT AREA: Constructing and Maintaining Buildings and Structures

**TASK # U291:** Repair metal structures with arc or oxyacetylene welder.

**COMPETENCY:** Weld and repair metal structures with arc and oxyacetylene welder.

**CRITERION MEASURE:**

1. Types of metal are correctly identified.
2. Correct welding rods are selected for the type of metal welded.
3. Arc or oxyacetylene welding is correctly chosen depending on the type of repairs to be made.
4. Welders are set up correctly for the type welding to be done.
5. Basic cutting and welding skills are correctly demonstrated.
6. Specified repairs are made to equipment following correct welding procedures.
7. Safety equipment is used and all safety precautions are observed.

**TASK # U292:** Frame, sheath, and roof building.

**COMPETENCY:**

1. Frame the desired size and pitchroof.
2. Install sheathing over framing.
3. Install finish roof materials.

**CRITERION MEASURE:**

1. Materials needed to frame, sheath, and roof buildings are accurately estimated.
2. Roofs are durable and do not leak.
3. Tools needed to roof a building are correctly identified and are used properly.
4. All measurements are accurately made.
5. Cutting, aligning, and installing materials are completed correctly.
6. Advantages and disadvantages of types of materials to use for framing, sheathing, and roofing are listed.
7. Local building codes and standards are followed.
8. All safety precautions are observed.

SUBJECT AREA: Constructing and Maintaining Buildings and Structures

TASK # U293: Install plumbing.

COMPETENCY: Install plumbing work in or to buildings.

CRITERION MEASURE:

1. Types of pipes and fixtures are correctly identified.
2. Plumbing tools are identified and are used correctly.
3. Type, amount, and cost of materials needed to do specified plumbing jobs are accurately estimated.
4. Basic plumbing skills are correctly demonstrated.
5. Plumbing codes applicable to the job are followed.
6. All safety precautions are observed.
7. Plumbing work functions properly with no leaks or bad joints.

SUBJECT AREA: Formulating Feeds and Feeding

**TASK # V294:** Develop rations for various ages and types of animals.

**COMPETENCY:** Develop rations for various ages and types of beef and dairy cattle.

**CRITERION MEASURE:**

1. Nutrient requirements for various breeds, sizes, and ages of cattle are provided from recall or from resource material.
2. Nutrient value of feeds are given by recall or from resource materials.
3. Rations that will provide the nutrient requirements of various breeds, types, and sizes of cattle are formulated.

**TASK # V295:** Calculate cost of rations and feed mixtures.

**COMPETENCY:** Calculate cost of rations and feed mixtures for beef and dairy cattle.

**CRITERION MEASURE:**

1. Costs of individual grains (corn, wheat, oats, etc.) and feed supplements are provided or obtained from resource publications.
2. Costs of mixing feeds are determined, including labor costs.
3. Total cost figures for complete rations are calculated accurately.

**TASK # V296:** Calculate feed efficiency.

**COMPETENCY:** Calculate feed efficiency for various rations on different ages and types of beef and dairy cattle.

**CRITERION MEASURE:**

1. Amount of feed consumed by various ages and types of animals over a specified period of time is accurately determined.
2. Amounts or units of production are accurately calculated over the specified period of time.
3. Feed efficiency is accurately calculated using the figures obtained during the test period.

## SUBJECT AREA: Formulating Feeds and Feeding

**TASK # V297:** Classify feeds.

**COMPETENCY:** Identify feeds and classify feeds for use by various classes of livestock.

**CRITERION MEASURE:**

1. Specified feeds are correctly identified by type and nutritional value.
2. Specified feeds are correctly analyzed and classified according to use by various grades and classes of livestock.

**TASK # V298:** Determine amount of feed additives to add to mixtures.

**COMPETENCY:** Determine amount of feed additives to add to mixtures according to the feeding program for various types, ages, and grades of livestock.

**CRITERION MEASURE:**

1. Characteristics and nutritional value of various feed additives are provided by recall and by use of resource materials.
2. Amount of feed and nutritional requirements of various types, ages, and grades of livestock are listed by recall and by using resource materials.
3. Amount of feed additives to add to mixtures for various types, ages, and grades of livestock is accurately calculated.

**TASK # V299:** Determine appropriate amount to feed per animal.

**COMPETENCY:** Determine how much feed is required for specified animals.

**CRITERION MEASURE:**

1. Animal nutritional requirements are listed by recall and by using resource materials.
2. Quality and characteristics of available feedstuffs are listed.
3. Amount of feed for specified animals is accurately determined based on the various factors affecting maintenance and growth requirements.

## SUBJECT AREA: Formulating Feeds and Feeding

**TASK # V300:** Determine appropriate form for preparing feed.

**COMPETENCY:** Determine appropriate form for preparing feed for best consumption by an animal or group of animals.

**CRITERION MEASURE:**

1. Factors relating to the form in which feeds may be fed are listed and discussed.
2. Advantages and disadvantages of the various forms of feed are correctly listed.
3. Costs of preparing feed or buying feed in various forms are determined.
4. Forms of feed that are normally best for specified types of livestock are accurately listed.

**TASK # V301:** Determine nutrient level requirements for animals.

**COMPETENCY:** Determine nutrient level requirements for various types, ages, and condition of livestock.

**CRITERION MEASURE:** Nutrient level requirements for various types, ages, and condition of livestock are correctly listed from recall and/or by using resource materials.

**TASK # V302:** Determine relative nutritive value of feedstuffs.

**COMPETENCY:** Determine relative nutritive value of feedstuffs for livestock.

**CRITERION MEASURE:**

1. Types and characteristics of feedstuffs are listed and discussed.
2. Relative nutritive values of specified feedstuffs are listed from recall and/or by using resource materials.

**TASK # V303:** Determine total amount of feed needed for herds.

**COMPETENCY:** Calculate amount of feed required for a specific number of animals over a certain time period.

**CRITERION MEASURE:**

1. The factors used to determine the amount of feed required for a specified number of animals over a certain time period are correctly listed and discussed.
2. The amount of feed needed for a specific number of animals over a certain time period is accurately calculated.

**TASK # V304:** Determine water requirements for animals.

**COMPETENCY:** Determine how much water an animal or group of animals needs in a certain period of time.

**CRITERION MEASURE:**

1. The water requirements for various types and classes of livestock are listed by recall and/or by using resource materials.
2. The variation in water requirements that occur with different environmental and climatic conditions is accurately described.

**TASK # V305:** Determine when feed additives should be withdrawn from animals.

**COMPETENCY:** Read and follow instructions on feed additive packaging and labels concerning withdrawal times for slaughter, etc.

**CRITERION MEASURE:** Instructions on packaging and labels concerning withdrawal times for feed additives for various factors are correctly read and interpreted.

TASK # V306: Determine when rations and mixtures should be changed.

COMPETENCY: Determine when rations and mixtures should be changed for different types and grades of livestock.

CRITERION MEASURE:

1. Factors affecting rations and mixtures for different types and grades of livestock are correctly listed and discussed.
2. Various rations and mixtures are analyzed to determine nutrient content and feed value.
3. Nutrient requirements for different types and grades of livestock are correctly listed by recall and/or by using resource materials.

TASK # V307: Evaluate how ration imbalance may affect production.

COMPETENCY: Determine the effect of ration imbalance on production for a specified group of livestock over a specific period of time.

CRITERION MEASURE:

1. Production figures are analyzed and correlated to the rations being fed.
2. Data are read and interpreted correctly for determining the effect of ration imbalance when compared with the results of a balanced ration on a similar group of livestock.

TASK # V308: Identify factors that influence feed requirements and feed efficiency.

COMPETENCY: Identify factors that influence feed requirements and feed efficiency for various types and grades of livestock.

CRITERION MEASURE: Factors that influence feed requirements and feed efficiency for various types and grades of livestock are correctly listed and adequately discussed.

**TASK # V309:** Determine purpose of various nutrients in rations and mixtures.

**COMPETENCY:** Determine purpose of various nutrients in rations and mixtures for various types of livestock.

**CRITERION MEASURE:** Functions of the various nutrients in specified rations and mixtures for different types of livestock are listed.

**TASK # V310:** Interpret feed analysis reports.

**COMPETENCY:** Read and interpret feed analysis reports.

**CRITERION MEASURE:**

1. Feed analysis terms are interpreted correctly.
2. Feed analysis reports are read and information is illustrated.

**TASK # V311:** Interpret feed tags and labels.

**COMPETENCY:** Read and interpret feed tags and labels.

**CRITERION MEASURE:**

1. Feed terms are correctly defined and interpreted.
2. Directions on feed tags and labels are correctly demonstrated.
3. Information on feed tags and labels is properly applied to various types and classes of livestock.

**TASK # V312:** Interpret feeding charts and labels.

**COMPETENCY:** Read and interpret feeding charts and labels.

**CRITERION MEASURE:**

1. Feeding terms are correctly defined and interpreted.
2. Information on feeding charts and labels is correctly applied to various types and classes of livestock.

**SUBJECT AREA: Formulating Feeds and Feeding**

**TASK # V313:** Select appropriate feeding methods.

**COMPETENCY:** Determine feeding methods best suited for various types and classes of livestock.

**CRITERION MEASURE:**

1. Various feeding methods are listed and discussed.
2. Feeding requirements for various types and classes of livestock are provided.
3. Feeding techniques necessary for various types of feed are listed.
4. Appropriate feeding methods are described for various types and classes of livestock.

**TASK # V314:** Determine how feed palatability may be improved.

**COMPETENCY:** Determine how feed palatability may be improved for more efficient use and consumption for various types and grades of livestock.

**CRITERION MEASURE:**

1. Feed ingredients are correctly analyzed and determined for palatability.
2. Feed processing and mixing techniques are determined.
3. Palatability requirements for different types and grades of livestock are discussed.
4. Ingredients and/or the feed processing and mixing techniques are altered to improve palatability.

**TASK # V315:** Determine amount of weight animals should gain.

**COMPETENCY:** Determine the weight gain potential for various types and grades of livestock for specified periods of time.

**CRITERION MEASURE:**

1. The average weight gain over specified periods of time for various types and grades of livestock is listed.
2. Specified animals are correctly evaluated to determine potential weight gain for specified time periods.

SUBJECT AREA: Formulating Feeds and Feeding

TASK # V316: Fill feed troughs, bunks, and self-feeders.

COMPETENCY: Fill feed troughs, bunks, and self-feeders using hand, automated, and power equipment.

CRITERION MEASURE:

1. Feed troughs, bunks, and self-feeders are filled to the correct level at appropriate times.
2. All feeding equipment is used correctly without damaging equipment or feeders.
3. Feed is not spilled or wasted during filling of troughs, bunks, or self-feeders.
4. All safety precautions are observed.

TASK # V317: Fill and clean waterers.

COMPETENCY: Fill and clean automatic and hand waterers by hand and by using power equipment.

CRITERION MEASURE:

1. Automatic and hand waterers are properly cleaned using tools and cleaning equipment and are free of dirt and other foreign matter.
2. Automatic waterers are properly operated.
3. All waterers are filled to the proper level periodically with fresh, clean water so that livestock will have water at all times.

TASK # V318: Prepare feed mixtures.

COMPETENCY: Prepare feed mixtures for different types and classes of livestock.

CRITERION MEASURE:

1. Feed requirements for different types and classes of livestock are listed.
2. Nutrient contents of various grains and feed supplements are listed.
3. Type, amount, and cost of feed ingredients are determined for feeding various types and classes of livestock.
4. Feed ingredients are thoroughly mixed with correct amount of each ingredient using proper equipment correctly and safely.

**TASK # V319:** Flush animals.

**COMPETENCY:** Flush specified types and classes of livestock.

**CRITERION MEASURE:**

1. Reasons for flushing are corrected listed.
2. Effect of flushing on animals reproductive system is provided.
3. Additional feed required and preparation techniques needed for flushing are listed and adequately discussed.
4. Specified animals are flushed following recommended procedures.

**TASK # V320:** Precondition animals for shipping.

**COMPETENCY:** Feed, vaccinate, de-worm, wean, castrate, etc. types and classes of livestock to precondition them for shipping.

**CRITERION MEASURE:**

1. Reasons for preconditioning animals for shipping are correctly listed.
2. Specific types of preconditioning activities for specified types and classes of livestock are correctly provided.
3. Preconditioning activities for specified types and classes of livestock are carried out following recommended procedures.

**TASK # V321:** Evaluate influence of using pasture on feeding requirements.

**COMPETENCY:** Evaluate influence of using pasture on feeding requirements for various types and classes of livestock.

**CRITERION MEASURE:**

1. Nutritional requirements for various types and classes of livestock are listed.
2. The nutritional value of using specified types of pasture for feed for various types and classes of livestock is determined.
3. The amount of various pasture grasses consumed by specified types and classes of livestock is correctly analyzed in terms of nutritional value and influence on feeding requirements.

**Task # V322:** Wean animals.

**COMPETENCY:** Wean animals.

**CRITERION MEASURE:**

1. Methods of weaning different types of animals are correctly described.
2. Times to wean different types of animals are listed.
3. The feeding schedule for weaning different types of animals is correctly described.
4. Specified animals are weaned following recommended procedures.

**TASK # V323:** Precondition animals for feedlot.

**COMPETENCY:**

1. Adjust animals to feed being used in the feedlot.
2. Administer vaccine, insecticide, wormer, or other medication as needed.

**CRITERION MEASURE:**

1. Reasons for preconditioning animals for feedlot are listed.
2. Procedures for preconditioning animals for feedlot are correctly carried out.

**TASK # V324:** Evaluate effect of various feeding practices on carcass composition and feed efficiency.

**COMPETENCY:** Evaluate effect of various feeding practices on carcass composition and feed efficiency for various types and classes of livestock.

**CRITERION MEASURE:**

1. Carcass quality standards and indicators are listed and discussed.
2. Feed efficiency calculations are correctly made.
3. Carcass quality is correctly evaluated.
4. Feeding practices needed to achieve maximum feed efficiency and carcass quality are provided.

**TASK # V325:** Identify moldy or spoiled feedstuffs.

**COMPETENCY:**

1. Inspect feedstuffs.
2. Observe characteristics and quality of feed.
3. Determine whether feed is spoiled or whether mold is present.

**CRITERION MEASURE:**

1. Characteristics of moldy and spoiled feedstuffs are listed.
2. Spoiled and moldy feed is correctly identified.

**TASK # V326:** Prepare milk replacer solution for calves.

**COMPETENCY:** List the characteristics of a good milk replacer, determine the amount to feed, and mix the milk replacers.

**CRITERION MEASURE:**

1. The characteristics of a good milk replacer are correctly listed.
2. The amount of milk replacer to feed to different size calves is calculated.
3. The directions on the bag are followed when mixing milk replacers.
4. The replacer solution is stirred well and mixed in the same way each time.

**TASK # V327:** Determine when calves may be started on grain and roughages.

**COMPETENCY:** Determine when, the type, and amount of grain and roughages dairy and beef calves may be feed.

**CRITERION MEASURE:**

1. Feed requirements and capacities of dairy and beef calves are provided.
2. Types, amounts, and the characteristics of grain and roughages that may be fed are listed.
3. The age when dairy and beef calves can usually be started on grain and roughages is listed.

SUBJECT AREA: Handling and Caring for Animals

TASK # W333: Assist animals in delivering young.

COMPETENCY: Assist animals in delivering young when normal birth is not possible or when the animal is having problems.

CRITERION MEASURE:

1. Signs of calving problems are correctly listed.
2. All equipment used in delivering the young is clean.
3. Delivery assistance techniques are correctly followed.
4. Determination is correctly made when a veterinarian should be called.

TASK # W334: Castrate animals.

COMPETENCY: Castrate animals correctly using knives, razors, burduzzos, bans, emasculators, and other proper equipment.

CRITERION MEASURE:

1. Methods used to prepare animals for castration are followed.
2. Tools and equipment used to castrate animals are clean and knives and razors are sharp.
3. Animals are properly tied and secured while being castrated.
4. The best ages to castrate various animals are listed.
5. Proper procedures for castrating are following using the many methods available.
6. Wounds are properly treated and cared for after castration.

TASK # W335: Check animal's milk supply.

COMPETENCY: Check animal's milk supply.

CRITERION MEASURE:

1. The indicators of milk supply are correctly listed.
2. The methods used to check milk supply are described and followed.

**TASK # W336:** Clean newborn animals.

**COMPETENCY:** Clean newborn animals when needed of mucus, membranes, etc. following recommended procedures.

**CRITERION MEASURE:**

1. All mucus is properly removed from the animal's mouth and nostrils.
2. All fluids are allowed to drain out of the animal that it might have inhaled during birth.
3. If the animal is not dried by its mother, rags and heat lamps are properly used to dry it.

**TASK # W337:** Determine space needed for animals.

**COMPETENCY:** Determine space requirements for various types and classes of livestock.

**CRITERION MEASURE:**

1. Factors affecting space requirements for livestock are listed.
2. Amount of space required for specified types and classes of livestock is provided by recall and/or by using resource materials.

**TASK # W338:** Disinfect and clip navel cord.

**COMPETENCY:** Disinfect and clip navel cord of newborn animals.

**CRITERION MEASURE:**

1. Reason for disinfecting and clipping the navel cord is given.
2. The navel cord is sprayed or dipped with a correct disinfectant.
3. The cord is properly tied with a string or a plastic clip is correctly attached to the cord if the cord bleeds.

TASK # W339: Evaluate influence of stress on growth and condition of animals.

COMPETENCY: Determine causes of stress on livestock and evaluate influence of stress on growth and condition of livestock.

CRITERION MEASURE:

1. Causes of stress on animals are listed and discussed.
2. Normal growth rates and condition of animals are listed.
3. Effect of stress on growth and condition of animals is analyzed and correctly determined.

TASK # W340: Exercise animals.

COMPETENCY: Properly exercise animals that require it for conditioning and other reasons.

CRITERION MEASURE:

1. Reasons for exercising animals are correctly listed.
2. Types of animals that need exercising are listed.
3. Exercise requirements for various types and classes of livestock are listed.
4. Specified animals are properly exercised following recommended procedures.

TASK # W341: Help young to nurse.

COMPETENCY: Clean the udder and assist calves in nursing if necessary.

CRITERION MEASURE:

1. The cow's udder is cleaned with soap and water and is free of dirt and manure.
2. Correct evaluation is made of when to assist the young to nurse.
3. The calve is placed in the proper position to nurse and is properly assisted.

**TASK # W342:** Identify signs of approaching birth.

**COMPETENCY:** Recognize signs of parturition in various types of livestock.

**CRITERION MEASURE:**
1. Signs of parturition in specified types of livestock are listed.
2. Signs of parturition in live animals are correctly identified.

**TASK # W343:** Identify due dates for animals.

**COMPETENCY:** Identify due dates for different types of livestock.

**CRITERION MEASURE:**
1. Conception dates for animals are correctly identified and recorded on appropriate forms.
2. Gestation periods for different types of livestock are correctly listed.
3. Due dates for specified livestock are accurately calculated.

**TASK # W344:** Isolate newly purchased animals for observation.

**COMPETENCY:** Isolate newly purchased animals for observation to identify condition of animals and any diseases that may be prevalent.

**CRITERION MEASURE:**
1. Reasons why newly purchased animals should be isolated and observed are correctly listed.
2. Animals are properly isolated.
3. Animals are observed and correct determination is made for condition, diseases prevalent, parasites, etc.
4. Proper treatment is prescribed for animals that need it.

SUBJECT AREA: Handling and Caring for Animals

TASK # W345: Mark animals for identification.

COMPETENCY: Mark specified types and classes of animals for identification following recommended procedures.

CRITERION MEASURE:

1. Reasons for marking animals for identification are correctly listed.
2. The various identification methods are listed and discussed.
3. Specified types and classes of livestock are marked for identification using different methods following recommended procedures.

TASK # W346: Move brood sows to farrowing quarters.

COMPETENCY: Prepare brood sows and move them to farrowing quarters.

CRITERION MEASURE:

1. Reasons for moving sows to farrowing quarters are listed.
2. Sows are properly cleaned prior to moving to quarters, and all dirt, manure, parasite eggs, and disease germs are removed.
3. Correct determination is made on when sows should be moved to farrowing quarters.
4. The farrowing quarters are thoroughly washed and cleaned by using an appropriate cleaning solution prior to moving the sows.
5. Sows are carefully moved and handled following recommended procedures.

TASK # W347: Move pigs to smaller litters.

COMPETENCY: Select and move pigs to smaller litters.

CRITERION MEASURE:

1. Reasons for moving pigs to smaller litters are listed.
2. Selection procedures are listed and discussed.
3. Techniques for insuring sows acceptance of new pigs are discussed and followed in actual practice.
4. Pigs are moved at the proper age and handled carefully following recommended procedures.

SUBJECT AREA: Handling and Caring for Animals

**TASK # W348:** Pen animals according to size, weight, and sex.

**COMPETENCY:** Pen various types and classes of animals according to size, weight, and sex.

**CRITERION MEASURE:**

1. Reasons for penning animals according to size, weight, and sex are listed.
2. Procedures used to select animals according to size, weight, and sex are discussed and followed in practical situations.
3. Animals are handled correctly and carefully in order not to injure them.

**TASK # W349:** Remove afterbirth.

**COMPETENCY:** Determine if the animal needs assistance in removing the afterbirth or placenta from her body and properly dispose of it.

**CRITERION MEASURE:**

1. The functions of the placenta are correctly listed.
2. The animal is observed and correct determination is made concerning when the veterinarian should be called to assist the animal in cleaning herself.
3. The afterbirth is disposed of following recommended procedures.

**TASK # W350:** Trim feet and hoofs.

**COMPETENCY:** Trim feet and hoofs of various types of animals using correct tools and procedures.

**CRITERION MEASURE:**

1. Reasons for trimming feet and hoofs of animals are correctly listed.
2. Tools needed to trim feet and hoofs are correctly identified and used.
3. Steps in trimming feet and hoofs are listed and correctly followed.

SUBJECT AREA: Handling and Caring for Animals

TASK # W351: Weigh animals.

COMPETENCY:

1. Weigh different types and classes of animals accurately following recommended procedures.
2. Estimate the weight of animals by using a weight tape.

CRITERION MEASURE:

1. Reasons for weighing animals periodically are listed and discussed.
2. Scales and other equipment used to weigh animals are correctly used.
3. Specified animals are weighed accurately.
4. Estimated weights of animals are determined by correctly using weight tapes.
5. Animals are handled and moved carefully during the weighing procedures.

TASK # W352: Clip needle teeth.

COMPETENCY: Clip the eight needle teeth on newborn pigs using small pliers or forceps without injuring the jaw or gums.

CRITERION MEASURE:

1. The eight needle teeth on newborn pigs are correctly identified.
2. Pliers and forceps are correctly used to clip the teeth.
3. The gums and jaws of pigs are not injured during the cutting procedure.
4. The pigs are carefully handled and are not dropped or injured in any way.

TASK # W353: Cut tails on feeder pigs.

COMPETENCY: Cut tails on feeder pigs using proper equipment and practicing sanitary conditions.

CRITERION MEASURE:

1. Reasons for cutting tails on feeder pigs are listed.
2. The tail, cutting utensils, and hands are thoroughly washed and rinsed in a disinfectant before and after the operation.
3. Proper tools are used safely and correct cutting procedures are followed.
4. Pigs are handled carefully and are not dropped or injured in any way.

**TASK # W354:** Give iron shots.

**COMPETENCY:** Inject pigs with needle and give liquid iron shots.

**CRITERION MEASURE:**

1. Reasons supplemental iron is needed for baby pigs are correctly listed.
2. A suitable iron preparation at the correct level is injected into baby pigs at the correct age following recommended procedures.
3. Pigs are correctly handled and they are not injured in any way.

**TASK # W355:** Check underlines on sows.

**COMPETENCY:** Check underlines on sows to determine number of teats and suitability as brood stock.

**CRITERION MEASURE:**

1. Procedures for examining underlines of sows are correctly followed.
2. The number of teats on sows are correctly determined.
3. Blind or inverted teats are recognized.
4. Sows are properly selected for brood stock that have good underlines and an adequate number of teats.

**TASK # W356:** Detusk boars.

**COMPETENCY:** Cut tusks from boars following recommended procedures.

**CRITERION MEASURE:**

1. Reasons for removing tusks from boars are correctly listed.
2. The time when tusks should be removed is correctly provided.
3. The procedures to use in removing tusks are followed.
4. Boars are handled and secured correctly and injuries to the boar and the workers are avoided.

**TASK # W357:** Regulate temperature and air flow in farrowing quarters.

**COMPETENCY:** Regulate temperature and air flow in farrowing quarters.

**CRITERION MEASURE:**

1. Temperature and other environmental requirements in the farrowing quarters are correctly provided.
2. Equipment is correctly operated to regulate air flow and temperature.

**TASK # W358:** Place pigs in brooder or use heat lamps.

**COMPETENCY:** Place pigs in brooder or use heat lamps when situations demand supplemental heat.

**CRITERION MEASURE:**

1. Pig temperature requirements are listed.
2. Situations when supplemental heat should be used are correctly described.
3. Brooder and heat lamp temperatures are correctly regulated to maintain proper heat for the pigs.
4. Pigs are correctly handled and injury to them is avoided.

**TASK # W359:** Wash sows and gilts before moving to farrowing quarters.

**COMPETENCY:** Wash sows and gilts with soap and warm water before moving to farrowing quarters.

**CRITERION MEASURE:**

1. Reasons for washing sows and gilts before moving to farrowing quarters are correctly listed.
2. Sows and gilts are properly handled during washing.
3. Sows and gilts, after washing, are free of all parasite eggs, manure, and disease germs.

**TASK # W360:** Paint sow's underline with iron compound.

**COMPETENCY:** Paint sow's underline with iron compound.

**CRITERION MEASURE:**

1. Reasons for supplying supplemental iron to baby pigs are correctly listed.
2. An appropriate solution and amount of iron is used to paint on the sow's udder.
3. Recommended procedures are followed when painting iron solution on udders.
4. Sows are properly handled before, during, and after painting udders.

**TASK # W361:** Ring animals.

**COMPETENCY:** Insert ring into animals nose following recommended procedures.

**CRITERION MEASURE:**

1. Reasons for ringing animals are correctly listed.
2. The recommended age to ring animals is provided.
3. Procedures for securing animals for ringing are discussed and carefully followed.
4. A nonrusting brass or aluminum ring is used.
5. Ringing procedures are discussed and followed.

**TASK # W362:** Bed animals.

**COMPETENCY:** Secure appropriate bedding and bed different types of livestock correctly.

**CRITERION MEASURE:**

1. Reasons for bedding livestock are correctly listed.
2. Characteristics of good bedding materials are listed and described.
3. Appropriate bedding materials are selected for different types of livestock.
4. Livestock are appropriately bedded.

Appendix

SUBJECT AREA: Handling and Caring for Animals

TASK # W363: Dehorn animals.

COMPETENCY: Secure animals and dehorn them using the electric dehorner, chemicals, and gouge.

CRITERION MEASURE:

1. Reasons for dehorning are correctly listed.
2. Methods for securing animals are discussed and carefully followed during actual demonstrations.
3. The age at which animals should be dehorned are listed for each of the methods used.
4. The procedures for dehorning for each of the steps are correctly listed and followed in actual practice.
5. Procedures to use for stopping excess bleeding are practiced.
6. Appropriate medication is correctly applied to the wounds.

TASK # W364: Move cows to calving pens.

COMPETENCY: Separate cows that are due to calve from the herd and move cows to calving pens.

CRITERION MEASURE:

1. Cows that are due to calve are correctly identified in the herd.
2. The time to move cows that are due to calve from the herd is correctly listed.
3. Cows due to calve are separated from the herd following recommended procedures and are moved to the calving pens without injury.

TASK # W365: Move calves to nurse cows.

COMPETENCY: Move calves that cannot nurse their mothers to nurse cows.

CRITERION MEASURE:

1. Reasons why some calves cannot nurse their own mothers are listed.
2. Calves that cannot nurse their mothers are identified and moved to nurse cows.
3. Techniques that assist in getting nurse cows to accept calves are discussed and followed.

**SUBJECT AREA:** Handling and Caring for Animals

**TASK # W366:** Restrain cows with ropes or hobbles.

**COMPETENCY:** Restrain cows with ropes or hobbles.

**CRITERION MEASURE:**

1. Cows are properly handled prior to, during, and after using restraining ropes and hobbles.
2. Proper size and types of ropes and hobbles are used on cattle.
3. Hobbles and ropes are properly placed on cattle and are secured.
4. Ropes and hobbles are carefully removed and cattle remain calm and manageable.

**TASK # W367:** Clip cattle.

**COMPETENCY:** Use appropriate tools safely and correctly to clip cattle.

**CRITERION MEASURE:**

1. Reasons for clipping cattle are listed.
2. Cattle are properly handled and secured for clipping.
3. Proper tools are selected and used.
4. Procedures for clipping cattle are followed.

**TASK # W368:** Determine length of dry period.

**COMPETENCY:** Determine the length of dry periods and when they should start for bred cows.

**CRITERION MEASURE:**

1. The recommended length of the dry period is listed.
2. The calving dates are accurately calculated.
3. The times when dry periods should start for specified cows are accurately calculated.

SUBJECT AREA: Handling and Caring for Animals

**TASK # W369:** Remove excess teats from heifers.

**COMPETENCY:** Remove excess teats from heifers at the proper age and use appropriate procedures.

**CRITERION MEASURE:**

1. Reasons for removing excess teats are listed.
2. Teats to remove are correctly identified.
3. Heifers are handled and restrained correctly without injury to the heifer.
4. Surgical techniques for teat removal are carefully followed.
5. The correct type and amount of medication is correctly applied to the wound.

SUBJECT AREA: Maintaining Herd Health

TASK # X370: Evaluate influence animal health has on production.

COMPETENCY:
1. Record and interpret production data.
2. Evaluate animal health practices.
3. Correlate health practices and production data.

CRITERION MEASURE:
1. Production data is correctly recorded and interpreted.
2. Animal health and management practices are identified and evaluated.
3. Health practices are correctly correlated with production data.

TASK # X371: Identify common livestock internal and external parasites.

COMPETENCY: Describe characteristics and identify common internal and external parasites of livestock.

CRITERION MEASURE:
1. Characteristics of common internal and external parasites are listed and described.
2. Common internal and external livestock parasites are correctly identified.

TASK # X372: Identify sanitation problems which may affect herd health.

COMPETENCY: Identify sanitation problems which may affect herd health.

CRITERION MEASURE:
1. Sanitation practices that affect herd health are identified and described.
2. Sanitation practices are followed in laboratory and actual work situations.
3. An effective sanitation program is outlined for maintaining good herd health.

SUBJECT AREA: Maintaining Herd Health

**TASK # X373:** Identify symptoms of nutritional imbalance.

**COMPETENCY:** Identify symptoms of nutritional imbalance for different types and classes of livestock.

**CRITERION MEASURE:**

1. Functions of nutrients are correctly listed.
2. Deficiency symptoms of specified nutrients are correctly identified.
3. Nutritional requirements of various types and classes of livestock are listed.
4. Specified symptoms of nutritional imbalance in animals are described.
5. Symptoms of nutritional imbalance in animals are identified.

**TASK # X374:** Select materials to control internal and external parasites.

**COMPETENCY:** Select recommended materials to control internal and external livestock parasites.

**CRITERION MEASURE:** Materials that control specific internal and external livestock parasites are correctly listed.

**TASK # X375:** Work with veterinarians in developing herd health program.

**COMPETENCY:**

1. Identify veterinarian.
2. List objectives for herd health program.
3. Cooperate with, give information to, and follow advice of the veterinarian.

**CRITERION MEASURE:**

1. Factors to consider in selecting a competent veterinarian are listed and discussed.
2. Objectives for a herd health program are listed in consultation with the veterinarian.
3. Situations when the veterinarian should be called are listed and discussed.

SUBJECT AREA: Maintaining Herd Health

TASK # X376: Disinfect buildings and equipment.

COMPETENCY: Clean and disinfect buildings and equipment.

CRITERION MEASURE:

1. Sanitation requirements for buildings and equipment are listed and discussed.
2. Buildings and equipment are washed following recommended procedures and are free of dirt, grease, manure, etc.
3. Characteristics of specific disinfectants are listed.
4. Appropriate disinfectants are chosen for specific tasks to be done and recommended procedures are followed for using each disinfectant.

TASK # X377: Select proper chemicals to clean buildings and equipment.

COMPETENCY: Select proper chemicals to clean buildings and equipment.

CRITERION MEASURE:

1. Cleaning requirements are correctly provided.
2. Cleaning and disinfecting chemicals that are available from various commercial firms are listed.
3. Appropriate chemicals are selected for specified cleaning and disinfecting tasks.

TASK # X378: Use insecticide repellents in buildings.

COMPETENCY: Select and safely use insecticide repellents in buildings.

CRITERION MEASURE:

1. The types of insects to control in farm buildings are correctly identified.
2. Appropriate insecticides are selected for specific insects to be controlled.
3. Insecticides are correctly applied and insects are controlled.
4. All safety precautions for handling and using insecticides are followed.

**TASK # X379:** Apply insecticides to control external parasites.

**COMPETENCY:** Select and safely apply insecticides to control external parasites on livestock.

**CRITERION MEASURE:**

1. The types of external parasites to control are correctly identified.
2. Appropriate insecticides are selected to control specific external parasites.
3. Insecticides are correctly applied and external parasites are controlled.
4. All safety precautions for handling and applying insecticides are followed.

**TASK # X380:** Identify symptoms of common diseases.

**COMPETENCY:** Observe animals and identify symptoms of common diseases of livestock and identify the diseases.

**CRITERION MEASURE:**

1. Symptoms of common diseases of livestock are listed and discussed.
2. Live animals and pictures of animals are observed and diseases are correctly identified by determining symptoms the animals exhibit.

**TASK # X381:** Identify symptoms of major parasites.

**COMPETENCY:** Identify symptoms of major parasites of livestock and identify the parasites.

**CRITERION MEASURE:**

1. Symptoms of major parasites of livestock are correctly listed and discussed.
2. Major parasites on livestock are correctly identified.

SUBJECT AREA: Maintaining Herd Health

**TASK # X382:** Evaluate life cycles of parasites to determine control procedures.

**COMPETENCY:** Illustrate life cycles of parasites and indicate control procedures.

**CRITERION MEASURE:**

1. Life cycles of specified parasites are correctly illustrated and discussed.
2. Effective control measures for specific parasites are listed.

**TASK # X383:** Calculate cost of treatments.

**COMPETENCY:** Calculate cost of treatments to control livestock parasites.

**CRITERION MEASURE:**

1. Specific types of parasites to control are determined.
2. Costs of chemicals, equipment to use, labor, application, and other costs for specific control measures are determined.
3. Method and amount of time needed to control parasites are determined.
4. Total costs of parasite treatments are correctly calculated.

**TASK # X384:** Supply medication through feed and water.

**COMPETENCY:** Supply medication to livestock through feed and water.

**CRITERION MEASURE:**

1. Types of diseases, parasites, etc. that may be treated by supplying medication through feed and water are listed.
2. Label directions for specific medications that are administered in feed and water are correctly read, interpreted, and followed.

**TASK # X385:** Isolate animals with transmissible diseases.

**COMPETENCY:** Remove diseased animals from the herd that have contagious or transmissible diseases and isolate them.

**CRITERION MEASURE:**

1. Reasons for isolating diseased animals are correctly listed.
2. Animals that have contagious diseases are correctly identified.
3. A qualified veterinarian is consulted if necessary to assist in determining the seriousness of the disease and whether diseased animals can be sold for slaughter.
4. Diseased animals are properly handled prior to and during isolation.
5. Isolation procedures are correctly discussed and followed.
6. Infected animals are not allowed to return to the herd until they have been diagnosed as being free of the disease.

**TASK # X386:** Select appropriate method to control disease.

**COMPETENCY:**

1. Determine specific disease present in livestock.
2. Examine control methods available.
3. Select appropriate control measure to use.

**CRITERION MEASURE:**

1. Specific livestock diseases are correctly identified.
2. Methods to control specific diseases are correctly listed.
3. Appropriate control measures to use in specific situations to control specified diseases are correctly selected.

**TASK # X387:** Worm animals.

**COMPETENCY:** Select appropriate type and amount of worm medication and worm different types and classes of livestock.

**CRITERION MEASURE:**

1. Internal parasites are correctly identified.
2. Appropriate worm medication is selected for specific types of internal parasites.
3. Labels directions on worm medication are correctly read, interpreted, and followed.
4. Different types and classes of livestock are wormed correctly following recommended types, dosages, and procedures for administering medication.
5. An effective program for controlling internal parasites of livestock is outlined.

**TASK # X388:** Vaccinate animals.

**COMPETENCY:** Plan a good vaccination program and vaccinate animals as needed for disease prevention and control.

**CRITERION MEASURE:**

1. A veterinarian is consulted when planning a vaccination program.
2. Diseases for which to vaccinate are correctly listed.
3. The times when different types and classes of livestock should be vaccinated for specific diseases are listed.
4. The vaccine is administered correctly.
5. Situations are described when vaccinations should be administered by veterinarians.
6. An effective vaccination program is outlined.

SUBJECT AREA: Maintaining Herd Health

**TASK # X389:** Determine amount of medication of materials needed in specific situations.

**COMPETENCY:** Determine amount of medication or materials needed in specific situations for disease and parasite control.

**CRITERION MEASURE:**

1. Need for medication is correctly determined.
2. Number of animals needing medication is determined.
3. Amount of medication and materials needed per animal is listed.
4. Total amount of medication needed for specified parasites and diseases for a specified number of animals is correctly calculated.

**TASK # X390:** Interpret labels on medication and insecticide containers.

**COMPETENCY:** Read and interpret labels on medication and insecticide containers.

**CRITERION MEASURE:**

1. Labels on medication and insecticide containers are correctly read, interpreted, and illustrated.
2. Directions on labels are correctly followed.
3. Safety precautions printed on labels are observed.

**TASK # X391:** Give intramuscular injections.

**COMPETENCY:** Prepare injections and give intramuscular injections.

**CRITERION MEASURE:**

1. Animals that may be vaccinated by intramuscular injections are listed.
2. Diseases that may be vaccinated for by intramuscular injections are listed.
3. Injections are properly prepared following recommended procedures.
4. Types and amounts of medication to use for specified intramuscular injections are correctly determined.
5. Intramuscular injections are given correctly following recommended procedures.

**TASK # X392:** Determine when to rotate pastures to control diseases and parasites.

**COMPETENCY:** Plan a pasture rotation program to meet recommendations on controlling diseases and parasites of livestock.

**CRITERION MEASURE:**

1. Factors affecting disease and parasite infestations of pastures are listed.
2. Types of disease and parasites infesting pastures are listed.
3. Types of pasture rotation programs are described.
4. Specific pasture rotation programs for specified diseases and parasites for different types of livestock are outlined and described using veterinarians and other resources.

**TASK # X393:** Observe new animals for symptoms of disease and parasites.

**COMPETENCY:** Observe new animals for symptoms of disease and parasites.

**CRITERION MEASURE:**

1. Amount of time to observe new animals for possible symptoms of diseases and parasites is listed.
2. Observation procedures are listed and described and are followed in actual situations.
3. Disease symptoms are recorded on appropriate forms.

**TASK # X394:** Determine when the veterinarian should be called.

**COMPETENCY:** Evaluate specific livestock problems and determine when the veterinarian should be called.

**CRITERION MEASURE:**

1. Characteristics of a competent veterinarian are listed.
2. Factors affecting when veterinarians should be called in for livestock problems are listed and described.
3. Specific examples are provided when the veterinarian should and should not be called.
4. Case examples are analyzed and correct evaluations are made concerning calling a veterinarian.

**TASK # X395:** Apply medication to cuts and bruises.

**COMPETENCY:** Apply medication to cuts and bruises following first aid procedures.

**CRITERION MEASURE:**

1. Cuts and bruises are cleaned of all foreign matter using alcohol or other appropriate cleaning agent and following recommended procedures.
2. Proper medication is selected.
3. Medication is applied following recommended procedures.

**TASK # X396:** Identify and isolate injured animals.

**COMPETENCY:** Identify and isolate injured animals from the remainder of the herd.

**CRITERION MEASURE:**

1. Animals are observed and injured animals are correctly identified.
2. Injured animals are properly removed from the herd and placed in isolation quarters.
3. Animals are handled carefully with no further injury occurring to any of the animals.

**TASK # X397:** Blood test cows.

**COMPETENCY:** Extract blood from cattle and test for specified conditions or diseases.

**CRITERION MEASURE:**

1. Cattle are properly handled and positioned correctly to extract blood.
2. Blood is correctly extracted following recommended procedures.
3. Recommended procedures are correctly followed for running specified tests on blood.
4. The test results are read and interpreted correctly and correct diagnoses are made.

SUBJECT AREA: Maintaining Herd Health

TASK # X398: Inspect udders for mastitis and bruises, cuts, and bumps.

COMPETENCY: Inspect udders for mastitis and bruises, cuts, and bumps.

CRITERION MEASURE:

1. The normal condition of udders is correctly described.
2. Bruises, cuts, and bumps on udders are identified.
3. Udders are properly examined to check for mastitis.

SUBJECT AREA: Marketing and Shipping Animals

**TASK # Y399:** Calculate expected returns and profits on sales.

**COMPETENCY:**

1. Determine production and marketing costs of specified animals.
2. Project sale prices for different types and grades of specified anaimals.
3. Determine net profit on the sale of specified animals.

**CRITERION MEASURE:**

1. The factors used in determining production and marketing costs of animals are listed and discussed.
2. Production and marketing costs for specified animals are correctly determined.
3. Sales prices for specified types or grades of animals are correctly quoted.
4. Net profits for the sale of specified animals are correctly determined.

**TASK # Y400:** Classify animals for market purposes.

**COMPETENCY:** Grade and select animals for specific market purposes.

**CRITERION MEASURE:**

1. Characteristics of the market grades for animals are correctly listed.
2. Selected animals are correctly graded.

**TASK # Y401:** Determine feasibility of participating in futures market.

**COMPETENCY:**

1. List the advantages and disadvantages of participating in the futures market.
2. From a case study of a farming situation, determine the feasibility participating in the futures market.

**CRITERION MEASURE:**

1. The advantages and disadvantages of participating in the futures market are correctly listed.
2. Projected returns for participating in the futures market are estimated.
3. Costs and returns from the present marketing system are accurately determined and compared with costs and returns using the futures market.

**TASK # Y402:** Evaluate influence of market grade on returns.

**COMPETENCY:**

1. Determine prices for various market grades.
2. Determine costs for producing different grades.
3. Evaluate influence of grades on return by comparing production costs, prices, etc. for various grades.

**CRITERION MEASURE:**

1. Prices for various market grades are provided over a specified time period.
2. Production costs for producing the various grades of animals are determined.
3. Costs of producing the various grades are compared with the prices expected for different grades.

**TASK # Y403:** Load animals.

**COMPETENCY:** Pen animals and load into carrier vehicles.

**CRITERION MEASURE:**

1. Animals are handled carefully and correctly with no injury occurring to animals.
2. Appropriate methods for penning and loading animals onto carrier vehicles are followed.

**TASK # Y404:** Prepare carriers for hauling animals.

**COMPETENCY:** Clean, disinfect, and repair carriers for hauling animals.

**CRITERION MEASURE:**

1. Carriers are cleaned and are free of manure, dirt, and other foreign matter.
2. Carriers are disinfected using approved chemicals.
3. Broken standards, boards, gates, etc. are repaired and replaced if necessary.

**TASK # Y405:** Select markets.

**COMPETENCY:**
1. List factors that are important for selecting markets.
2. Evaluate various markets.
3. Determine market needs.
4. Examine differences in various markets.
5. Select market best suited to particular operation.

**CRITERION MEASURE:**
1. Market selection factors are correctly listed and discussed.
2. Markets are evaluated and best markets are chosen that fit particular livestock situations.

**TASK # Y406:** Interpret market reports.

**COMPETENCY:**
1. Read and interpret market reports.
2. Apply market report information to particular livestock situations.

**CRITERION MEASURE:**
1. Market reports are correctly read and interpreted.
2. Market report information is correctly applied to practical livestock situations.

**TASK # Y407:** Analyze market cycles.

**COMPETENCY:**
1. Study and interpret market reports.
2. Evaluate price swings.
3. Determine cycle length.
4. Determine factors affecting market cycles.

**CRITERION MEASURE:**
1. Factors affecting price swings and market cycles are correctly determined.
2. Cycle lengths are correctly determined.
3. Price swings are properly analyzed.

SUBJECT AREA: Marketing and Shipping Animals

**TASK # Y408:** Select appropriate marketing system.

**COMPETENCY:**

1. Evaluate various marketing alternatives.
2. Evaluate specific livestock operations.
3. Compare factors and select marketing system that best suits operation.

**CRITERION MEASURE:**

1. Marketing systems are described and analyzed.
2. Marketing systems are selected that best suit particular livestock operations.

**TASK # Y409:** Select truckers.

**COMPETENCY:** Select truckers that have the experience, equipment, and attitude necessary to do a quality job of hauling animals to market.

**CRITERION MEASURE:**

1. Factors important in selecting truckers for hauling livestock are listed.
2. Job requirements of truckers are listed and discussed.

**TASK # Y410:** Identify characteristics of USDA grades.

**COMPETENCY:** List USDA grades for cuts of meat and for live animals, provide grade requirements or standards, and grade cuts of meat and live animals.

**CRITERION MEASURE:**

1. USDA grades for cuts of meat and for live animals are listed correctly.
2. Grade requirements or standards for cuts of meat and live animals are correctly provided.
3. Cuts of meat and live animals are graded correctly.

SUBJECT AREA: Marketing and Shipping Animals

TASK # Y411: Determine affect middlemen and retailers have on producer's prices.

COMPETENCY: Determine affect middlemen and retailers have on producer's prices.

CRITERION MEASURE:

1. Marketing procedures are correctly analyzed and discussed.
2. Mark-up of prices from the producer to the buyer is correctly determined.
3. The role of middlemen and retailers is described.
4. The relationship between middlemen and retailers and producers is correctly described.

TASK # Y412: Determine whether animals should be held over for another year's income.

COMPETENCY: Analyze the market situation, price trends, the livestock program and goals, and other factors to determine when to market animals.

CRITERION MEASURE:

1. Market demand and prices are correctly determined.
2. Animals' market value at various periods of time is correctly estimated.
3. All factors affecting marketing decisions are listed and discussed.

TASK # Y413: Determine most economical weights to market.

COMPETENCY:

1. Compare market prices for various weights of livestock.
2. Determine production costs per pound of gain.
3. Select weight and price ratio which will give the most favorable return.

CRITERION MEASURE:

1. Market prices for various weights of livestock are determined.
2. Production costs per pound of gain are calculated.
3. Weight and price ratios are compared to determine the best rates of return.

SUBJECT AREA: Marketing and Shipping Animals

**TASK # Y414:** Calculate shrinkage.

**COMPETENCY:**
1. Weigh carcass at slaughter.
2. Weigh carcass after aging.
3. Determine weight loss between slaughter and packaging.

**CRITERION MEASURE:**
1. Scales on which animals are weighed are correctly used and accurately read.
2. Weight loss is correctly given in lbs. and percentage of loss between slaughter weight and packaging weight.

**TASK # Y415:** Calculate dressing percent.

**COMPETENCY:**
1. Determine live weight.
2. Weigh carcass at slaughter.
3. Calculate difference between live weight and carcass weight and compute dressing percent.

**CRITERION MEASURE:**
1. Carcass weight is correctly defined.
2. Scales are correctly used to weigh live animals and live weights are correctly determined.
3. Carcass weight is correctly determined and dressing percent is calculated using live weight and carcass weight data.

**TASK # Y416:** Estimate market grades.

**COMPETENCY:**
1. List the various grades of livestock.
2. List the standards or requirements for the various grades.
3. Observe livestock and estimate market grades for a group of animals.

**CRITERION MEASURE:**
1. The grades of livestock are correctly listed.
2. The standards or requirements for the various grades are correctly listed.
3. Market grades for a group of livestock are accurately estimated.

SUBJECT AREA: Marketing and Shipping Animals

TASK # Y417: Develop plan to spread marketing throughout year.

COMPETENCY: Plan production schedules for livestock enterprises in order to market animals throughout the year.

CRITERION MEASURE:

1. Production schedules for different livestock enterprises are developed.
2. Alternate marketing options are correctly described.
3. Plans for distributing resources throughout the year are described.

TASK # Y418: Sort animals according to size and weight.

COMPETENCY: Separate animals into uniformly sized groups for sale.

CRITERION MEASURE:

1. Animals are correctly weighed and sorted into groups of same size.
2. Size and weight of animals are correctly estimated and sorted into groups.
3. Animals are correctly handled following recommended handling practices.

TASK # Y419: Determine when animals are ready to market.

COMPETENCY: Evaluate the market situation, condition of animals, weight of animals, and other relevant factors to determine when animals are ready to market.

CRITERION MEASURE:

1. Demand and price for animals at different weights and grades are listed.
2. Market grades of animals for sale are determined.
3. Most appropriate times to sell livestock are estimated.

**TASK # Y420:** Determine number of animals to load.

**COMPETENCY:** Select carrier for animals, determine space availability, and calculate number of animals to load.

**CRITERION MEASURE:**

1. Square footage of floor space on selected carriers is accurately calculated.
2. Amount of space required on carriers for different types and classes of livestock is listed.
3. The number of animals to load on carriers is accurately determined considering types and classes of livestock, space requirements, size and type of carrier, and distance to travel.

**TASK # Y421:** Consign outstanding individuals at sales.

**COMPETENCY:** Determine value of outstanding individuals, select animals to consign, and complete consignment process.

**CRITERION MEASURE:**

1. Consignment process is outlined and described.
2. Outstanding animals are selected for consignment and market value determined.
3. Consignment process is carried out correctly.

**TASK # Y422:** Determine base butterfat test.

**COMPETENCY:** Take samples of milk and determine the percentage of butterfat.

**CRITERION MEASURE:**

1. Samples of milk are taken following recommended procedures.
2. The correct percentage of butterfat is determined.

SUBJECT AREA: Marketing and Shipping Animals

**TASK # Y423:** Compare milk hauling expenses of companies.

**COMPETENCY:** Determine milk hauling expenses of various companies and compare the costs to determine the least expensive company.

**CRITERION MEASURE:**

1. The factors that make up the milk hauling expenses of companies are listed and discussed.
2. Milk handling expenses of various companies are determined.
3. Milk handling expenses are compared and the least expensive company is determined.

**TASK # Y424:** Compare company base milk prices and differential prices for butterfat differences.

**COMPETENCY:** Determine company base milk prices, prices for butterfat differences, and compare these prices among various companies.

**CRITERION MEASURE:**

1. Base milk prices paid by specified companies are determined.
2. Prices paid for butterfat differences above base milk prices are determined.
3. Base milk prices and butterfat prices among specified companies are compared and price differentials are correctly determined.

**TASK # Y425:** Read measuring stick on bulk tank.

**COMPETENCY:** Determine amount of milk in bulk tank by correctly reading the measuring stick.

**CRITERION MEASURE:** Amount of milk in bulk tank is correctly determined by reading and interpreting the measuring stick.

SUBJECT AREA: Selecting Breeding and Feeder Stock

**TASK # Z426:** Calculate percentage and value of lean and prime cuts found in animals.

**COMPETENCY:**

1. Determine carcass or package weight of animals.
2. Identify the lean and prime cuts found in animals and determine market value of these cuts.
3. Determine the weight of lean and prime cuts of animals and calculate the percentage of lean and prime cuts.

**CRITERION MEASURE:**

1. Scales are read and interpreted correctly to determine the carcass or package weight of animals.
2. The lean and prime cuts of animals are correctly identified.
3. The market value of the lean and prime cuts is determined.
4. The weight of lean and prime cuts of animals is accurately determined and the percentage of these cuts to the total carcass is accurately calculated.

**TASK # Z427:** Determine age of animals.

**COMPETENCY:**

1. Examine herd records and pedigrees to determine age of animals.
2. Examine animals' condition and appearance to estimate age.

**CRITERION MEASURE:**

1. Herd records and pedigrees are read and interpreted correctly to determine age of animals.
2. Ages of animals are accurately estimated by studying the condition and appearance of animals.

**TASK # Z428:** Establish production goals for culling purposes.

**COMPETENCY:**

1. Evaluate the herd.
2. Review production figures.
3. Set production goals for culling.

**CRITERION MEASURE:**

1. Production records are accurately kept on livestock enterprises.
2. Herd management practices and plans are evaluated and discussed.
3. Realistic production goals are set for culling based on production records and herd management practices.

## SUBJECT AREA: Selecting Breeding and Feeder Stock

**TASK # Z429:** Evaluate advantages of various breeds.

**COMPETENCY:**

1. Study breed records and production data.
2. Review breed performance in local area.
3. Evaluate breed attributes and weaknesses with reference to management practices.

**CRITERION MEASURE:**

1. Breed records and production data are read and interpreted correctly.
2. Performance of breeds in the local area is analyzed and correct comparisons made.
3. Advantages and disadvantages of various breeds of animals are listed.

**TASK # Z430:** Evaluate general condition of animals.

**COMPETENCY:** Observe animals and determine their condition, abnormal behavior, and appearance.

**CRITERION MEASURE:**

1. Factors to look for in observing animals are listed and described.
2. Types of abnormal behavior and appearance in animals are described.
3. Live animals are observed and their condition is correctly analyzed.

**TASK # Z431:** Evaluate influence of consumer's demands on type of animals to select.

**COMPETENCY:**

1. Determine market cycles.
2. Determine customer preferences, both past and present.
3. Determine types of animals, needed to meet consumer's demands.

**CRITERION MEASURE:**

1. Market cycles of various types of livestock are determined.
2. Past and present customer preferences for meat are listed.
3. Influence of consumer's demands on types of animals to select is accurately described.

SUBJECT AREA: Selecting Breeding and Feeder Stock

**TASK # Z432:** Evaluate overall performance and health records of animals.

**COMPETENCY:**
1. Read and evaluate performance data.
2. Review health records and determine health performance.
3. Relate performance and health of animals to management practices.

**CRITERION MEASURE:**
1. Performance of livestock is determine by reading and correctly interpreting performance data.
2. Health of animals is determined by reviewing health records.
3. Performance and health of animals is evaluated and related to management practices.

**TASK # Z433:** Evaluate the degree various traits and characteristics are inherited.

**COMPETENCY:** Discuss the degree various traits and characteristics of animals are inherited.

**CRITERION MEASURE:** The degree that various traits and characteristics of animals that are inherited are described.

**TASK # Z434:** Identify major retail cuts of animals.

**COMPETENCY:** Identify major retail cuts of animals and the sections of the body from which they come.

**CRITERION MEASURE:**
1. Detail cuts of animals are correctly identified.
2. The sections of body from which retail cuts come are correctly determined.

**TASK # Z435:** Identify parts of animals.

**COMPETENCY:** Identify parts of specified types of animals.

**CRITERION MEASURE:** Parts of specified types of animals are correctly identified.

**TASK # Z436:** Identify reputable sources for obtaining stock.

**COMPETENCY:**

1. Locate sources of stock.
2. Check references on the sources.
3. Inspect prospective sources and observe management practices to insure reputability of sources.

**CRITERION MEASURE:**

1. Sources for obtaining stock are listed.
2. Methods to check out sources to insure reputability are listed and discussed.
3. Prospective sources are observed and good and bad management practices are determined and discussed.

**TASK # Z437:** Inspect animals for defects.

**COMPETENCY:** Inspect specified animals for abnormal functions or conditions.

**CRITERION MEASURE:** Specified animals are observed and inspected and defects in functions and/or conditions are identified.

**TASK # Z438:** Inspect animals for desirable traits and characteristics.

**COMPETENCY:**

1. List and describe the desirable traits and characteristics in livestock.
2. Inspect specified animals and determine the desirable traits and characteristics.

**CRITERION MEASURE:**

1. The desirable traits and characteristics of different types of livestock are listed and described.
2. Specified animals are inspected and desirable traits and characteristics are determined.

SUBJECT AREA: Selecting Breeding and Feeder Stock

**TASK # Z439:** Select breeding system to follow.

**COMPETENCY:**

1. Evaluate herd for genetic capacility.
2. Determine market demand in the area.
3. Evaluate sources of stock.
4. Determine goals for the herd and formulate plans for reaching them.
5. Select breeding system that will best meet needs.

**CRITERION MEASURE:**

1. The advantages and disadvantages of the various breeding systems are correctly listed and discussed.
2. The management practices necessary to implement and maintain various breeding systems are discussed.
3. Appropriate breeding systems for different types of livestock operations are described.
4. Factors to consider in selecting an appropriate breeding system are listed and described.

**TASK # Z440:** Select feeder animals.

**COMPETENCY:**

1. Observe feeder animals.
2. Estimate weights of animals.
3. Evaluate health and general condition.
4. Grade for quality.

**CRITERION MEASURE:**

1. Factors to consider in selecting feeder animals are correctly listed and discussed.
2. Specified feeder animals are observed and appropriate ones are selected that meet quality standards and other factors.

**TASK # Z441:** Select foundation stock.

**COMPETENCY:**

1. Evaluate management and goals of operation.
2. Decide on type of operation.
3. Look at stock available for purchase.
4. Choose particular animals for use in breeding program.

**CRITERION MEASURE:**

1. Factors to consider in selecting foundation stock are listed and discussed.
2. Appropriate foundation stock are chosen that meet quality standards and other factors.

## SUBJECT AREA: Breeding

TASK # AA446: Determine due date for animals.

COMPETENCY: Determine parturition date for specified animals.

CRITERION MEASURE:

1. The gestation period for specified animals are correctly provided.
2. Signs of parturition for different animals are listed and discussed.
3. Accurate breeding records are kept on appropriate forms.

TASK # AA447: Determine number of males needed for herd.

COMPETENCY:

1. Determine number of cows in herd.
2. Evaluate condition and age of males available for service.
3. Decide on breeding system and method of mating to be used.
3. Correlate the above and decide on number of males to use.

CRITERION MEASURE:

1. The factors to consider in determining the number of males needed for various breeds and types of animals are correctly listed and discussed.
2. The number of males needed to service different herds of animals is correctly determined after taking into consideration the factors affecting the number needed.

TASK # AA448: Determine when to breed.

COMPETENCY: Evaluate different livestock enterprises including labor and management requirements and other factors and determine appropriate times to breed animals.

CRITERION MEASURE: The factors to consider in determining when to breed animals for the types of operations engaged in are correctly listed and discussed.

## SUBJECT AREA: Breeding

**TASK # AA449:** Identify various causes of breeding difficulty.

**COMPETENCY:** Determine causes of breeding difficulty in various types of livestock.

**CRITERION MEASURE:**

1. The factors that may cause breeding difficulty in various types of animals are correctly listed and discussed.
2. Sperm and egg counts are correctly run on animals.
3. Feeding, medication, and environmental conditions of breeding stock are correctly evaluated and appropriate recommendations are made.
4. Physiology of reproductive systems of animals is correctly diagrammed and discussed.

**TASK # AA450:** Select breeding method.

**COMPETENCY:**

1. Determine number of animals to be bred.
2. Determine number of male animals available for breeding service and evaluate the capability of each.
3. Evaluate management skills and time available for working on breeding programs.
4. Select appropriate breeding methods based on above factors for different livestock operations.

**CRITERION MEASURE:**

1. The different breeding methods for livestock enterprises are listed and discussed.
2. The factors affecting the selection of appropriate breeding methods are correctly listed and discussed.
3. Appropriate breeding methods for different livestock operations are recommended based on an analysis of case studies.

**TASK # AA451:** Pregnancy test animals.

**COMPETENCY:** Determine pregnant females for different types of livestock.

**CRITERION MEASURE:**

1. The usual methods of determining pregnancy in animals are listed and discussed.
2. Absence of animals' heat periods are correctly determined.

SUBJECT AREA: Handling and Disposing of Animal Wastes

**TASK # BB452:** Identify factors affecting animal wastes decay.

**COMPETENCY:** Determine environmental conditions to which wastes are exposed and identify the factors that affect the decay of animal wastes.

**CRITERION MEASURE:**

1. The environmental conditions to which animal wastes are exposed are listed and described.
2. The factors that affect the decay of animal wastes are correctly identified and discussed.

**TASK # BB453:** Prevent waste runoff from feedlots and housing quarters.

**COMPETENCY:**

1. Examine feedlots and housing for livestock to determine the natural drainage flow of wastes.
2. Prevent waste runoff from feedlots and housing quarters.

**CRITERION MEASURE:**

1. Feedlots and housing quarters are examined and correct determinations are made for the natural drainage flow of wastes.
2. Methods that may be used to prevent waste runoff from feedlots and housing quarters are provided and discussed.
3. Actual feedlots and housing quarters are examined and appropriate recommendations are made for preventing waste runoff.

**TASK # BB454:** Remove and properly dispose of dead animals.

**COMPETENCY:**

1. Move animals' carcasses from livestock areas.
2. Bury, burn, incinerate, etc. all carcasses.
3. Use proper cleaning and sanitation practices in all areas exposed to dead carcasses.

**CRITERION MEASURE:**

1. The restrictions and regulations concerning the disposal of dead carcasses are correctly provided.
2. Dead carcasses are appropriately handled and removed from livestock areas.
3. Methods of disposing of dead carcasses are listed and properly carried out.
4. Cleaning and sanitation practices in all areas exposed to dead carcasses are discussed and appropriately carried out.

SUBJECT AREA: Handling and Disposing of Animal Wastes

**TASK # BB455:** Properly remove wastes from quarters and pens.

**COMPETENCY:**

1. Study requirements for waste removal and equipment needed for different systems.
2. Study layout of quarters and pens and determine feasible methods of waste removal.
3. Examine cost, management, labor, and other factors for the different methods of waste removal.
4. Recommend appropriate waste removal methods and remove waste efficiently and sanitarily.

**CRITERION MEASURE:**

1. Different waste removal systems for living quarters and pens are described.
2. Appropriate methods of waste removal are recommended for different layouts of living quarters and pens.
3. Wastes are properly removed from quarters and pens using equipment safely and efficiently.
4. Quarters are clean and sanitary after waste removal.

**TASK # BB456:** Identify and select method of manure disposal.

**COMPETENCY:**

1. Evaluate disposal job requirements.
2. Evaluate tools, equipment, labor, management, etc. available.
3. Choose economical and efficient methods of manure disposal for different livestock operations.

**CRITERION MEASURE:**

1. Methods of manure disposal are listed.
2. Resources needed for different methods of manure disposal are listed and discussed.
3. Appropriate methods of manure disposal are recommended for different types of livestock operations.

**TASK # BB457:** Dispose of wastes properly.

**COMPETENCY:** Dispose of animal wastes in accordance with health, safety, and ethical practices.

**CRITERION MEASURE:**

1. Regulations and restrictions for waste disposal are correctly listed and discussed.
2. Management skills and capabilities required for waste disposal are described.
3. Wastes are disposed of following recommended practices in laboratory, work experience, and other practical situations.

## SUBJECT AREA: Milking the Cow

TASK # CC461: Determine when cow is finished milking.

COMPETENCY: Watch cows closely to determine when they are finished milking.

CRITERION MEASURE: The flow of milk through the milk lines and the collapse of the cow's udder are watched and a correct determination is made when the cow is through milking.

TASK # CC462: Determine when milk is ready for shipping.

COMPETENCY: Determine when milk is ready to be transferred from the storage tank to the truck.

CRITERION MEASURE:

1. The capacity of the storage tank is known.
2. The number of milkings that the storage tank will hold is determined.
3. The temperature of the milk is 40°F or lower prior to transfer.
4. The amount of milk in the storage tank is accurately measured.

TASK # CC463: Dip teat cups in sanitizing solution.

COMPETENCY: Clean and sanitize teat cups.

CRITERION MEASURE:

1. Procedures for cleaning and sanitizing teat cups are listed.
2. Sanitizing solutions are recommended that are best for the bacteria that is to be killed in cups.
3. Labels are read and interpreted correctly on sanitziers, and all safety precautions are observed.
4. Sanitizers are used correctly following manufacturer's recommendations.

TASK # CC458: Adjust pulsator speed.

COMPETENCY: Adjust controls to regulate pulsator rate.

CRITERION MEASURE:

1. Equipment is handled safely and carefully without damaging it.
2. Pulsation rate is properly adjusted for correct and efficient operation.
3. Pulsation rate is correctly determined.

TASK # CC459: Attach milkers.

COMPETENCY: Attach milkers on cows following the recommended steps to properly complete the job.

CRITERION MEASURE:

1. Cows are handled gently.
2. Teat cups are placed correctly on teats without cups slipping off.
3. Improper attachment of milkers are determined.
4. Reasons for proper attachment of milkers are listed and discussed.

TASK # CC460: Check for abnormal milk.

COMPETENCY: Sample milk to determine if it is abnormal or has unnatural flabors.

CRITERION MEASURE:

1. Foreign materials in milk are correctly detected.
2. Causes of unnatural flabors in milk are listed.
3. Steps in sampling milk for unnatural flavors are listed and discussed.
4. Milk samples are judged and unnatural flavors are identified.
5. Characteristics of normal and abnormal milk are provided.

SUBJECT AREA: Milking the Cow

**TASK # CC464:** Establish and follow milking schedule.

**COMPETENCY:** Set up and follow milking schedules that are compatible with the factors affecting schedules.

**CRITERION MEASURE:**

1. The factors that affect milking schedules are correctly listed and discussed.
2. Recommended milking schedules are compatible with the factors relating to particular situations.
3. Reasons for setting up and establishing a consistent milking schedules are correctly provided.

**TASK # CC465:** Evaluate influence pulsator speed has on milking.

**COMPETENCY:** Determine the influence pulsator speed has on milking time and possible damage to teats.

**CRITERION MEASURE:**

1. Pulsation rate and pulsation ratio are defined correctly.
2. Pulsation rate and ratio are correctly described in relation to the effect on speed of milking and on teat damage.

**TASK # CC466:** Prevent climbing of milkers.

**COMPETENCY:**

1. List and describe the factors that cause climbing of milkers.
2. Make proper adjustments on equipment that will prevent climbing of milkers.

**CRITERION MEASURE:**

1. The factors that cause climbing of milkers are correctly listed and discussed.
2. Methods to prevent climbing of milkers are correctly applied in practical situations.
3. Problems that may result from climbing of milkers are adequately explained.

TASK # CC467: Strip cows.

COMPETENCY: Machine strip cows to remove all the milk from the udder and the teat.

CRITERION MEASURE:

1. Reasons for machine stripping are correctly listed.
2. The procedures for machine stripping are described and correctly applied in actual situations.
3. Less than 20 seconds is spent on machine stripping.
4. After cows are machined stripped, all milk is removed from the udder.

TASK # CC468: Wash and dry udders.

COMPETENCY: Wash and dry udders using warm water, a sanitizer, and clean towels.

CRITERION MEASURE:

1. The reasons for washing and drying udders are correctly provided.
2. The procedures for washing and drying udders are described and then followed in actual situations.
3. After washing and drying, the udders are free of all foreign matter.

SUBJECT AREA: Sanitizing and Maintaining Milking Equipment

**TASK # DD469:** Adjust vacuum.

**COMPETENCY:** Adjust the vacuum to specified levels in order for cows to be properly milked.

**CRITERION MEASURE:**

1. The vacuum system is correctly diagrammed and the procedures for how it operates are adequately explained.
2. The recommended vacuum levels for different systems are obtained from the operator's manuals.
3. Vacuum gauges are correctly read and interpreted.
4. Vacuum levels are correctly adjusted during the milking operation to maintain recommended levels.
5. Effects of incorrect vacuum levels during milking operations are correctly described.

**TASK # DD470:** Check freon in coolers.

**COMPETENCY:** Check and maintain proper freon level in coolers.

**CRITERION MEASURE:**

1. The proper level of freon is correctly determined.
2. The proper procedure for checking freon levels is followed.
3. Freon is properly added if it is found to be low.

**TASK # DD471:** Clean pulsators.

**COMPETENCY:** Clean pulsators using recommended agents and following recommended procedures.

**CRITERION MEASURE:**

1. The reasons for keeping pulsators clean are correctly provided.
2. Pulsators are cleaned using recommended cleaning agents and following recommended procedures.
3. After cleaning, pulsators are free of dirt, milk deposits, and other foreign matter.
4. All safety precautions are observed and labels on cleaning solutions are read and correctly interpreted.

SUBJECT AREA: Sanitizing and Maintaining Milking Equipment

**TASK # DD472:** Remove milkstone.

**COMPETENCY:** Remove milkstone deposits from milkers, pipelines, and bulk tanks using recommended cleaners and following recommended procedures.

**CRITERION MEASURE:**

1. Milkstone deposits are correctly defined.
2. Milkers, pipelines, and bulk tanks are cleaned using recommended cleaning agents and following recommended procedures.
3. After cleaning, milkers, pipelines, and bulk tanks are free of dirt, milkstone deposits, and other foreign matter.
4. All safety precautions are observed and labels on cleaning solutions are read and correctly interpreted.
5. All equipment is handled safely without damaging it.
6. Reasons for removing milkstone deposits are correctly provided.

**TASK # DD473:** Replace inflations.

**COMPETENCY:** Remove and replace rubber inflations following recommended procedures.

**CRITERION MEASURE:**

1. The function of rubber inflations is correctly described.
2. The reasons rubber inflations wear out are listed and discussed.
3. Rubber inflations are removed when necessary and new ones properly installed following recommended procedures.
4. Problems worn inflations may cause are correctly listed.
5. Teat cups function properly after inflations are replaced.

**TASK # DD474:** Replace rings on milker heads.

**COMPETENCY:** Remove and replace rings on milker heads following recommended procedures.

**CRITERION MEASURE:**

1. The function of the rings on milker heads is provided.
2. Rings are properly removed and replaced following recommended procedures.
3. Milkers function properly after rings are replaced.
4. Worn rings are correctly identified.

SUBJECT AREA: Sanitizing and Maintaining Milking Equipment

TASK # DD475: Replace teat cup liners.

COMPETENCY: Remove and replace teat cup liners following recommended procedures.

CRITERION MEASURE:

1. Worn teat cup liners are positively identified.
2. New teat cup liners of the correct size are selected.
3. Teat cup liners are properly removed and replaced following recommended procedures.
4. Problems worn teat cup liners may create are listed and discussed.

TASK # DD476: Selecting proper cleaning agents.

COMPETENCY: Select cleaning agents for each of the parts of the milkers and milking equipment.

CRITERION MEASURE:

1. Sanitizers are correctly defined.
2. Types of cleaners and sanitizers used on dairy equipment are listed and discussed.
3. Cleaners and sanitizers are selected for specific parts of dairy equipment that will not harm the equipment but will still do an adequate job.
4. Availability and costs of specified cleaners and sanitiziers are provided.

TASK # DD477: Set automatic timers.

COMPETENCY: Adjust controls to set automatic timers on equipment that can automatically perform routine functions.

CRITERION MEASURE:

1. Time cycles for functions performed are provided.
2. Controls on automatic timers are properly adjusted to meet the time requirements of the jobs to be performed.

## SUBJECT AREA: Testing Soil and Plant Tissues

**TASK # EE478:** Take representative soil sample.

**COMPETENCY:** Take a soil sample which will be representative of the field being tested following recommended procedures.

**CRITERION MEASURE:**

1. Number and location of test sites represent the field's characteristics.
2. Sampling procedure is based on recommended techniques.

**TASK # EE479:** Prepare soil and plant tissues to be submitted to testing laboratory.

**COMPETENCY:** Prepare soil and plants for mailing in accordance with instructions provided by the testing laboratory.

**CRITERION MEASURE:**

1. Samples are prepared according to instructions.
2. Information sheets are correctly completed providing needed information.
3. Samples and information sheets are mailed to appropriate testing laboratories.

**TASK # EE480:** Prepare forms to submit with samples.

**COMPETENCY:** Prepare forms by filling in requested information concerning samples.

**CRITERION MEASURE:**

1. All information requested on forms is provided.
2. Forms are correctly completed.

**TASK # EE481:** Interpret test results and recommendations.

**COMPETENCY:** Interpret laboratory soil and plant tissue test results and recommendations.

**CRITERION MEASURE:**

1. Test results are read and their meaning interpreted correctly.
2. Recommendations are interpreted in a manner in which corrective measures are applied to practical situations.

## SUBJECT AREA: Fertilization

TASK # FF482: Use soil test results to plan fertility program.

COMPETENCY: Use the test results of soil samples to plan a proper fertility program.

CRITERION MEASURE:

1. A practical liming program is planned according to test result recommendations.
2. A fertilization program is planned that provides sufficient nutrients as recommended by soil test results.

TASK # FF483: Calculate estimated cost of fertilizer and lime needed.

COMPETENCY: Calculate the costs of the fertilizer and the lime needed for the farm's fertility program.

CRITERION MEASURE:

1. Cost estimates are obtained from local reputable dealers.
2. Estimates of amount and costs are reasonable.
3. Mathematical calculations are correct.

TASK # FF484: Determine amount of fertilizer and lime to apply.

COMPETENCY: Determine the amount of fertilizer and lime to apply based on soil test results.

CRITERION MEASURE:

1. Soil test results concerning the amount of fertilizer and lime to apply are read and interpreted correctly.
2. Amounts of lime and fertilizer to apply per acre for various crops are computed correctly using soil test results.

## SUBJECT AREA: Fertilization

**TASK # FF485:** Determine kind of fertilizer and lime to apply.

**COMPETENCY:** Determine the kind of fertilizer and lime to apply based on soil test results.

**CRITERION MEASURE:**

1. The correct analysis of fertilizer is chosen based on soil test results.
2. All major and minor elements recommended by the soil test are included in the chosen fertilizer.
3. The type of liming materials recommended by the soil test is chosen.

**TASK # FF486:** Determine when to apply fertilizer and lime.

**COMPETENCY:** Determine when to apply fertilizer and lime for best results.

**CRITERION MEASURE:**

1. The factors affecting when lime and fertilizers should be applied are listed and discussed.
2. The approximate times for lime and fertilizers to be applied under different conditions are correctly provided.

**TASK # FF487:** Evaluate effect leaching and placement have on nutrient availability.

**COMPETENCY:** Evaluate the effect of leaching and the effect fertilizer placement has on nutrient availability.

**CRITERION MEASURE:**

1. The factors affecting leaching of nutrients in different soils are listed and discussed.
2. The effect of leaching on nutrient availability is adequately discussed.
3. The effect fertilizer placement has on nutrient availability is adequately provided.

## SUBJECT AREA: Fertilization

TASK # FF488: Evaluate influence soil pH has on nutrient availability.

COMPETENCY: Evaluate the influence pH has on plants ability to extract nutrients from the soil.

CRITERION MEASURE:
1. The definition of pH is provided and the pH scale is adequately discussed.
2. The pH range for best growth of specified plants is listed.
3. The effect of soil pH on nutrient availability to plants is described.

TASK # FF489: Identify function of lime in crop production.

COMPETENCY: Identify the function of lime and its influence on crop production.

CRITERION MEASURE:
1. The function of lime is identified and described from basic scientific research.
2. Calcium and magnesium is recognized as essential elements which are contained in lime and used to alter the soil pH.
3. The influence lime has on crop production is provided.

TASK # FF490: Identify function of major nutrients in crop production.

COMPETENCY: Identify the function of the major nutrients and their influence on crop production.

CRITERION MEASURE:
1. Major nutrients are correctly identified.
2. The function(s) of each major nutrient on crop production is/are listed.

TASK # FF491: Identify nutrient deficiency symptoms in crop production.

COMPETENCY: Identify nutrient deficiency symptoms in crop production evidenced by irregularities in plant growth.

CRITERION MEASURE: Irregularities in plant growth are recognized and the deficient nutrient(s) identified.

SUBJECT AREA: Fertilization

**TASK # FF492:** Identify function of micronutrients in crop production.

**COMPETENCY:** Identify the functions of micronutrients and their influence on crop production.

**CRITERION MEASURE:**

1. Micronutrients are correctly identified.
2. The function(s) of each micronutrient on crop production is/are listed.

**TASK # FF493:** Interpret labels on fertilizer bags.

**COMPETENCY:** Interpret the label information on fertilizer bags.

**CRITERION MEASURE:**

1. All label information on fertilizer bags is correctly read and interpreted.
2. Label information is used in planning the fertility program and in selecting the fertilizer needed

**TASK # FF494:** Apply fertilizers in liquid, gaseous, and dry forms.

**COMPETENCY:** Apply fertilizer in the different manufacturer forms, including liquid, gas, and dry, using calibrated equipment.

**CRITERION MEASURE:**

1. The right equipment is selected for fertilizer application and properly calibrated for application of specified rates.
2. Equipment is operated according to instructions found in the operator's manual.
3. Fertilizer is applied in a recommended and efficient manner.
4. All safety precautions are observed.

## SUBJECT AREA: Fertilization

TASK # FF495: Mix fertilizer solutions.

COMPETENCY: Mix fertilizer solutions in preparation for application.

CRITERION MEASURE:

1. Fertilizer solution materials are mixed in correct proportions by hand or mechanically.
2. Equipment is used correctly and safely.
3. Mixing by agitation is continued until application to prevent settling and irregular application.

TASK # FF496: Interpret manufacturer's fertilization rate charts.

COMPETENCY: Interpret and use manufacturer's fertilization rate charts.

CRITERION MEASURE:

1. Rate charts are read, interpreted, and practical applications made.
2. Determined rates are in line with recommended rates and fertility program.

TASK # FF497: Determine the nutrient requirements of crops.

COMPETENCY: Determine the nutrient requirements of crops in order to adequately supply the crops' needs.

CRITERION MEASURE:

1. Factors used in determining nutrient needs for crops are provided.
2. Crops' nutrient needs are listed by using reliable scientific information.

SUBJECT AREA: Fertilization

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| TASK # FF498: | Select proper method to apply fertilizer. |
| COMPETENCY: | Select the best method for application of fertilizer to insure plant's needs are being met and that takes into account resources available. |
| CRITERION MEASURE: | 1. The various methods of applying fertilizer are listed and the advantages and disadvantages of each method are provided.<br>2. The type of equipment needed to apply fertilizer by the various methods is provided.<br>3. The factors affecting the forms of fertilizer that may be used are listed.<br>4. The application method selected is practical in terms of being efficient, economical, and uses the equipment and other resources already available. |

| | |
|---|---|
| TASK # FF499: | Calibrate fertilizer equipment. |
| COMPETENCY: | Calibrate fertilizer equipment to apply desired rate per acre. |
| CRITERION MEASURE: | 1. Methods of calibrating different types of equipment are illustrated.<br>2. Equipment is correctly calibrated to apply the correct amount of fertilizer per acre.<br>3. Fertilizer is distributed uniformly. |

| | |
|---|---|
| TASK # FF500: | Identify factors that influence effectiveness of fertilizers. |
| COMPETENCY: | Identify the factors that influence fertilizers being available for plants' use after application. |
| CRITERION MEASURE: | Factors affecting fertilizer's availability to plants are identified and discussed. |

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TASK # FF501: Recognize signs of fertilizer injury.

COMPETENCY: Recognize the signs of fertilizer injury on various crops.

CRITERION MEASURE:
1. Characteristics of fertilizer injury are listed and described.
2. Signs and symptoms of fertilizer injury are recognized.
3. Fertilizer injury is distinguished from plant diseases and insect damage.

TASK # FF502: Identify factors that influence fertilizer requirements.

COMPETENCY: Identify factors that influence the requirements of fertilizer for crop production.

CRITERION MEASURE:
1. Factors influencing fertilizer requirements for various crops are identified using reliable information.
2. In practical situations, corrective action is taken to insure that needed nutrients are supplied to the crops.

TASK # FF503: Transfer fertilizers from nurse tank to applicator.

COMPETENCY: Transfer fertilizers from the nurse tank to the fertilizer applicator.

CRITERION MEASURE:
1. Fertilizer is transferred from the nurse tank to the applicator in an efficient manner, without spillage, following recommended procedures.
2. Equipment is used properly following manufacturer's operating instructions.
3. Safety rules are observed during the transfer.

SUBJECT AREA: Controlling Insects, Diseases, and Weeds

**TASK # GG504:** Identify common diseases, insects, and weeds.

**COMPETENCY:** Identify visually and by using resource materials the common diseases, insects, and weeds that are encountered in crop production.

**CRITERION MEASURE:**

1. Common diseases, insects, and weeds of crops are visually identified.
2. Common diseases, insects, and weeds of crops are correctly identified by using resource materials.

**TASK # GG505:** Identify damage caused by insects, diseases, and weeds.

**COMPETENCY:** Identify visually and by using resource materials the damage caused by insects, diseases, and weeds to crops.

**CRITERION MEASURE:**

1. Crop damage caused by insects is correctly identified as insect damage.
2. Crop damage caused by diseases is correctly identified as plant disease.
3. Crop damage caused by weeds is correctly identified.
4. Crop damage caused by insects, diseases, and weeds is correctly identified by using resource materials.

**TASK # GG506:** Evaluate influence of weeds, diseases, and insects on crop production.

**COMPETENCY:** Evaluate the influence of weeds, diseases, and insects on crop production.

**CRITERION MEASURE:**

1. The advantages and disadvantages of weeds, diseases, and insects on crop production are listed and discussed.
2. The influence of weeds on crop production was recognized and evaluated.
3. The influence of diseases on crop production was recognized and evaluated.
4. The influence of insects on crop production was recognized and evaluated.

SUBJECT AREA: Controlling Insects, Diseases, and Weeds

**TASK # GG507:** Inspect fields to determine when weed, insect, and disease infestations require control.

**COMPETENCY:** Inspect fields to determine when it is economically feasible to treat crops for control of weeds, insects, and diseases.

**CRITERION MEASURE:**

1. Correct weed counts are taken in specified fields and correct evaluation is made for treatment based on reliable factors.
2. Correct insect counts and type of damage are taken in specified fields and correct evaluation is made for treatment based on reliable factors.
3. Disease symptoms are recognized and correct evaluation is made for treatment based on reliable factors.

**TASK # GG508:** Evaluate life cycle of weeds and insects to determine appropriate control measures.

**COMPETENCY:** Evaluate the life cycles of weeds and insects to determine the most appropriate time and method of control.

**CRITERION MEASURE:**

1. Life cycles of weeds and insects are illustrated by recall and/or by using resource materials.
2. Life cycle stages of weeds and insects that are the most susceptible to control are listed.
3. The most appropriate methods of controlling weeds and insects are listed and described.

**TASK # GG509:** Identify various means by which diseases, insects, and weeds are spread.

**COMPETENCY:** Identify ways in which diseases, insects, and weeds are spread.

**CRITERION MEASURE:** The methods by which diseases, insects, and weeds are spread are correctly listed and described.

SUBJECT AREA: Controlling Insects, Diseases, and Weeds

TASK # GG510: Identify disease and insect resistant varieties of plants.

COMPETENCY: Identify varieties of plants that are resistant to certain disease and insects.

CRITERION MEASURE:
1. Varieties of plants that are resistant to specified diseases and insects are correctly identified.
2. Sources for obtaining information on disease and insect resistant varieties of plants are listed and are used correctly.

TASK # GG511: Distinguish between harmful and beneficial insects.

COMPETENCY: Distinguish between insects that are harmful or beneficial to crop production.

CRITERION MEASURE:
1. The beneficial and harmful effects of insects are listed and discussed.
2. Harmful insects are identified by distinguishing characteristics.
3. Beneficial insects are identified by distinguishing characteristics.

TASK # GG512: Calculate costs of controls.

COMPETENCY: Calculate the costs of controls for weeds, insects, and diseases.

CRITERION MEASURE:
1. Factors relating to costs of controls for weeds, insects, and diseases are identified and discussed.
2. Sources of information concerning costs of controls for weeds, insects, and diseases are listed and used effectively.
3. The cost per acre for controlling weeds, insects, and diseases on various crops is accurately calculated.

SUBJECT AREA: Controlling Insects, Diseases, and Weeds

TASK # GG513: Select appropriate chemicals to control various insects, diseases, and weeds.

COMPETENCY: Select the appropriate chemicals to control various insects, diseases, and weeds.

CRITERION MEASURE:

1. The factors affecting chemical control measures are identified and discussed.
2. The beneficial and harmful effects of using various chemicals to control insects, diseases, and/or weeds are identified.
3. Chemicals selected are recommended for the control of insects, diseases, and/or weeds under specified conditions.

TASK # GG514: Determine appropriate mechanical and cultural means to control insects, diseases, and weeds.

COMPETENCY: Determine mechanical and cultural methods of control for insects, diseases, and weeds.

CRITERION MEASURE:

1. Appropriate mechanical and cultural methods to control insects, diseases, and weeds are listed.
2. Factors that influence decisions on specific mechanical and cultural methods to use are identified and discussed.
3. Information sources on mechanical and cultural control methods are identified and used effectively.

TASK # GG515: Determine amount of chemicals to apply.

COMPETENCY: Make a determination of the amount of chemical to apply for control of harmful organisms.

CRITERION MEASURE: Label specifications on the amount of chemicals to apply for control of harmful organisms are followed and the amounts mixed and applied are correct for different field sizes.

TASK # GG516: Determine when to apply chemicals.

COMPETENCY: Make a determination of time to apply chemicals for best control of harmful organisms.

CRITERION MEASURE:
1. Stages when weeds, insects, and diseases are most easily controlled are listed.
2. Factors affecting time of application of control measures are identified.

TASK # GG517: Mix chemicals properly.

COMPETENCY: Mix chemicals with dispersing agent.

CRITERION MEASURE:
1. Label directions for mixing chemicals are read and correctly interpreted.
2. Specified chemicals are mixed following label directions and equipment is used properly.
3. All safety precautions are observed.

TASK # GG518: Calibrate application equipment.

COMPETENCY: Calibrate application equipment to apply recommended rate of chemical.

CRITERION MEASURE:
1. The various methods of calibrating equipment are listed and practically illustrated.
2. Equipment is correctly calibrated by using the various methods.

SUBJECT AREA: Controlling Insects, Diseases, and Weeds

TASK # GG519: Select correct type and size nozzles and tips.

COMPETENCY: Select the types and sizes of nozzles and tips for the desired spray pattern.

CRITERION MEASURE:

1. The available nozzles and spray tip patterns are listed and adequately discussed.
2. Nozzles and tips are selected that meet the requirements for the types of pests being controlled and the types of plants or crops being sprayed.

TASK # GG520: Apply chemicals in dust and liquid form.

COMPETENCY: Make application of chemicals in dust form or liquid form for control of harmful organisms.

CRITERION MEASURE:

1. Chemicals are applied at the appropriate time and in the correct forms to control the pests adequately.
2. Equipment is operated according to manufacturer's recommendations.
3. Application is made uniformly over the treated area.
4. All safety precautions are observed.
5. Equipment is thoroughly cleaned after each use, removing all residues.

TASK # GG521: Interpret chemical labels.

COMPETENCY: Read and interpret information on the labels of agricultural chemical containers.

CRITERION MEASURE: Specified label information on chemical containers is read and adequately illustrated by various methods.

TASK # GG522: Destroy plant residues.

COMPETENCY: Use or destroy plant residues left after harvest.

CRITERION MEASURE:

1. Reasons for destroying plant residues are listed.
2. Methods of destroying or using plant residues are listed and discussed.
3. Plant residues are adequately used or destroyed following recommended procedures.

TASK # GG523: Identify factors that influence chemical effectiveness.

COMPETENCY: Identify the factors that influence the effectiveness of chemicals applied to crops.

CRITERION MEASURE:

1. Factors that influence the effectivensss of chemicals are listed and discussed.
2. The factors are taken into account when applying chemicals in laboratory and farm situations.

TASK # GG524: Recognize chemical injury to plants.

COMPETENCY: Recognize the injury caused to plants by chemicals.

CRITERION MEASURE:

1. Chemical injury to plants is recognized and the type injury is correctly categorized.
2. Corrective action is identified and discussed that should prevent further chemical injuries.

TASK # GG525: Interpret chemical compatability charts.

COMPETENCY: Read and interpret the information given on chemical compatability charts.

CRITERION MEASURE: Specified information on chemical compatability charts is correctly read, interpreted, and illustrated by appropriate methods.

## SUBJECT AREA: Establishing Crops

**TASK # HH526:** Identify crops by seed and/or plants.

**COMPETENCY:** Identify crops by their seeds or by plant parts visually or by using resource materials and correctly spell the identified crops.

**CRITERION MEASURE:**

1. Selected crops are visually identified by seeds and/or plant parts and common names are spelled correctly.
2. Selected crops are identified by using appropriate resource materials and common names are spelled correctly.

**TASK # HH527:** Identify advantages and disadvantages of various varieties.

**COMPETENCY:** Identify the advantages and the disadvantages of crop varieties for farm use.

**CRITERION MEASURE:** Advantages and disadvantages of various crop varieties are accurately listed.

**TASK # HH528:** Select varieties.

**COMPETENCY:** Select the varieties that will be used in the farm program.

**CRITERION MEASURE:** Selected varieties for planting are accurately based on evaluations of the advantages and disadvantages of the various varieties.

**TASK # HH529:** Inoculate seeds.

**COMPETENCY:** Inoculate seeds for better germination following recommended procedures.

**CRITERION MEASURE:**

1. Types of inoculant are listed.
2. Seeds are properly treated with inoculant according to recommended procedures.
3. Inoculated seed are planted and a high percentage germinate.

SUBJECT AREA: Establishing Crops

**TASK # HH530:** Prepare seedbed.

**COMPETENCY:** Prepare a good seedbed by plowing, disking, tilling, harrowing, etc.

**CRITERION MEASURE:**

1. Appropriate tools and equipment are selected.
2. The equipment used in seedbed preparation is set up and adjusted correctly to provide maximum efficiency.
3. Tractor operation is efficient and handling procedures listed in the operator's manual are followed.
4. All safety precautions are observed.
5. The prepared seedbed is well pulverized, smoothed, and finely textured to a minimum depth of 3-4 inches.

**TASK # HH531:** Calibrate planting equipment.

**COMPETENCY:** Calibrate planting equipment for spacing of seed as desired by the drill.

**CRITERION MEASURE:**

1. The correct plates are chosen for different size seeds to achieve the desired spacing.
2. An area is planted and the amount of seed used is determined.
3. Using the computed rate, the amount of seed needed per acre is accurately computed.
4. The computed ratio is accurately compared with the recommended rate and a proper decision is made on whether a change in rate is necessary.

**TASK # HH532:** Determine seeding rates.

**COMPETENCY:** Determine the seeding rates per acre based on recommended plant populations for different crops.

**CRITERION MEASURE:**

1. The factors affecting recommended seeding rates are correctly listed and discussed.
2. Sources of information concerning seeding rates are determined.
3. Seeding rates per acre for different crops are provided using research data recommendations and taking into consideration other factors.

SUBJECT AREA: Establishing Crops

**TASK # HH533:** Determine when to plant.

**COMPETENCY:** Determine the proper time to plant various crops to take advantage of the best environmental conditions for plant germination and growth.

**CRITERION MEASURE:**
1. The germination requirements for various crops are listed.
2. Factors affecting planting time are listed.

**TASK # HH534:** Select proper seeding methods.

**COMPETENCY:** Select the proper seeding methods for various crops.

**CRITERION MEASURE:**
1. The methods of seeding are listed and the suggested methods used for various crops are discussed.
2. Planting methods are correctly chosen for specified crops.

**TASK # HH535:** Identify advantages and disadvantages of various planting methods.

**COMPETENCY:** Identify the advantages and disadvantages of various planting methods.

**CRITERION MEASURE:** Advantages and disadvantages of the various planting methods are correctly listed and discussed.

**TASK # HH536:** Determine proper planting depth.

**COMPETENCY:** Determine the best planting depth for various type seeds to assure good germination, sprouting, and growth.

**CRITERION MEASURE:**
1. Factors affecting planting depth are identified.
2. Planting depths for selected seeds are correctly listed based on recommendations by agricultural research.

**TASK # HH537:** Identify problems related to seeding failure.

**COMPETENCY:** Identify problems that are related to seeding failure in crop production.

**CRITERION MEASURE:**

1. The requirements for seed germination are listed.
2. Factors relating to seeding failure are provided.

**TASK # HH538:** Transplant appropriate crops.

**COMPETENCY:** Transplant those crops that require transplanting from the beds to the fields following recommended procedures.

**CRITERION MEASURE:**

1. Factors to use in selecting transplants are stated.
2. Plants are removed from the plant bed following recommended procedures.
3. Transplants are properly protected when transported to the field.
4. Hand and mechanical equipment is properly used during the transplanting operation.
5. Transplanting is timely and orderly.
6. Transplants are spaced on the rows uniformly and roots are adequately covered.

**TASK # HH539:** Interpret information on seed tags.

**COMPETENCY:** Read, interpret, and apply information found on seed tags.

**CRITERION MEASURE:**

1. Specified information on seed tags is properly interpreted and applied in laboratory or field settings.
2. All safety precautions provided on seed tags are followed.

TASK # HH540: Determine when to graze new forage seedings.

COMPETENCY: Determine when different ages and kinds of livestock should graze various forage seedings.

CRITERION MEASURE:

1. Factors relating to grazing of different types of forage seedings are listed.
2. Specified forage seedings are observed and correct decisions are made concerning the ages and types of livestock that should graze on it.

TASK # HH541: Select companion crops.

COMPETENCY: Determine crops for a farming situation that are compatible in terms of resources used including labor, land, tillage requirements, equipment use, double cropping, etc.

CRITERION MEASURE:

1. The factors relating to choices for companion crops are listed.
2. Companion crops are chosen that are realistic in terms of given resources or for particular farming situations.

SUBJECT AREA: Marketing and Shipping Crops

TASK # II542: Calculate expected returns and profits on sales.

COMPETENCY: Calculate expected costs, returns, and profits on sale of specified crops.

CRITERION MEASURE:
1. All costs involved in producing specified crops are itemized and determined.
2. Marketing crops are itemized and determined.
3. Expected prices for crops are determined.
4. Expected profits are calculated based on total returns and costs.

TASK # II543: Classify crops for market purposes.

COMPETENCY: Classify specified crops for market purposes.

CRITERION MEASURE:
1. Market classifications for specified crops are correctly listed.
2. Criteria for placing crops in certain market classes are listed and described.
3. Specified crops are examined and correctly placed in market classifications.

TASK # II544: Determine feasibility of feeding or selling grains and forage.

COMPETENCY: Determine the feasibility of feeding the grain and forage produced or selling it.

CRITERION MEASURE:
1. Expected profits from feeding grain and forage produced on the farm are calculated accurately.
2. Expected profits from selling the grain and forage produced on the farm and buying bulk feed for livestock are calculated accurately.
3. Expected profits from feeding the grain and forage versus selling it and buying bulk feed are compared and logical conclusions are developed.

**TASK # II545:** Determine feasibility of participating in futures market.

**COMPETENCY:** Determine whether or not it would be feasible to participate in the futures market.

**CRITERION MEASURE:**

1. The advantages and disadvantages of participating in the futures market are correctly listed and discussed.
2. A description of how the futures market operates is correctly provided.
3. Legal aspects of the futures market are correctly provided.
4. Expected profits from the sale of specified crops versus placing all and part of the crops on the futures market are calculated, profits compared, and logical conclusions are developed.

**TASK # II546:** Evaluate influence quality has on value.

**COMPETENCY:** Evaluate the effect of quality upon the possible value of farm crops.

**CRITERION MEASURE:**

1. The grades or classifications of specified crops are listed and the criteria for the grades are listed and discussed.
2. The range of prices that may be received for the various grades of crops are correctly determined.

**TASK # II547:** Inspect for color, maturity, and foreign matter.

**COMPETENCY:** Visually inspect farm crops for color, maturity, and foreign matter.

**CRITERION MEASURE:**

1. Color characteristics for high quality crops are described.
2. Mature characteristics of specified farm crops are correctly described.
3. Foreign materials to look for in farm crops are listed.
4. Specified farm crops are inspected and are correctly analyzed for color, maturity, and foreign matter.

SUBJECT AREA: Marketing and Shipping Crops

**TASK # II548:** Prepare carriers for hauling.

**COMPETENCY:**
1. Repair and maintain any mechanical devices involved on carriers.
2. Clean carriers in preparation of loading or packing.
3. Arrange racks, gates, etc., if needed.
4. Pack or load carriers following recommended procedures for the crops shipped.

**CRITERION MEASURE:**
1. Maintenance and repair requirements for motors and other parts of carriers are listed or determined and they are completed correctly.
2. Sanitation requirements for hauling specified farm products are listed and carriers are properly cleaned and prepared and meet these requirements.
3. Racks, gates, compartments, etc. are properly arranged for best accommodation of the farm products hauled.
4. Loading or packing requirements for specified farm crops are described and carriers are loaded or packed properly and meet these requirements.

**TASK # II549:** Select markets.

**COMPETENCY:** Select markets that best serve the needs of the farm considering the crops he has for sale.

**CRITERION MEASURE:**
1. The factors that are important in selecting markets for farm crops are correctly listed and discussed.
2. Case studies are evaluated and markets are chosen that are logical for the situations described.

**TASK # II550:** Interpret market reports.

**COMPETENCY:** Interpret the information that is given in various agricultural journals and specialized marketing reports.

**CRITERION MEASURE:**
1. Units of measurement used in reporting are interpreted correctly.
2. Grades for crops are correctly defined.
3. Prices, price trends, and other market information and terms are correctly interpreted.

SUBJECT AREA: Marketing and Shipping Crops

TASK # II551: Analyze market cycles.

COMPETENCY: Analyze the cycles of supply and demand for farm crops.

CRITERION MEASURE:
1. Past trends for specified farm crops are determined.
2. The effect of supply and demand on specified farm crops is explained.
3. The expected supplies of crops are determined.
4. Expected increased or decreased demand for farm crops is determined.

TASK # II552: Select appropriate marketing system.

COMPETENCY: Determine and select a marketing system that is most appropriate to the farm crop enterprises and marketing objectives.

CRITERION MEASURE:
1. Various types of marketing systems are described and analyzed.
2. Marketing goals and objectives are compared with various marketing systems.
3. A marketing system is selected that is most appropriate for the particular crop enterprises engaged in.

TASK # II553: Select appropriate methods of shipping.

COMPETENCY: Determine and select the shipping methods that are most appropriate for specified farm crops.

CRITERION MEASURE:
1. Shipping requirements for specified farm crops are correctly listed.
2. Markets where farm products will be shipped are determined.
3. Shipping methods available are determined.
4. Costs of various shipping methods are calculated.
5. Shipping methods are selected that meet crop requirements, that are available, and that are cost effective.

SUBJECT AREA: Marketing and Shipping Crops

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| TASK # II554: | Identify various grades. |
| COMPETENCY: | Identify the grades for specified farm products. |
| CRITERION MEASURE: | 1. Grades for specified farm products are correctly listed.<br>2. Criteria for placing products in various grades are listed and discussed.<br>3. Specified farm crops are examined and are correctly graded. |

| | |
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| TASK # II555: | Determine whether to hold grain for another year's income. |
| COMPETENCY: | Determine if grain should be held over and sold and included in that year's income. |
| CRITERION MEASURE: | 1. Market demand and current prices are correctly determined for grain.<br>2. Projected demand, supply, and prices at various times are determined.<br>3. Cost of storing or holding grain is correctly calculated.<br>4. Costs and returns are compared for selling grain and for holding for an additional period of time. |

| | |
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| TASK # II556: | Pack and prepackage vegetables. |
| COMPETENCY: | 1. Pack vegetables in proper containers before marketing.<br>2. Prepackage vegetable in various size and proper containers. |
| CRITERION MEASURE: | 1. Types of containers needed for various types of vegetables are determined.<br>2. Types of vegetables that can be prepackaged are listed.<br>3. Prepackaging methods that enhance the product are described and correctly demonstrated.<br>4. Vegetables are properly packed and prepackaged for shipping and marketing. |

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SUBJECT AREA: Marketing and Shipping Crops

TASK # II557: Trim vegetables for market.

COMPETENCY: Trim vegetables to improve their appearance and marketability.

CRITERION MEASURE:

1. Vegetables are properly trimmed and are free of damaged, diseased, dead, and discolored tissues.
2. Methods of how vegetables should be trimmed are listed and are properly demonstrated.
3. Vegetables that normally require trimming are listed.

**TASK # JJ558:** Determine dates for harvesting.

**COMPETENCY:** Determine the dates when specified crops will be at the correct stage for harvest.

**CRITERION MEASURE:**

1. Normal harvesting dates for specified crops are listed.
2. The period of time that is normally required from planting to harvest stage for specified crops is correctly provided.
3. Effects of environmental factors on speed of maturation are correctly listed and discussed.

**TASK # JJ559:** Determine stage of maturity.

**COMPETENCY:** Determine when specified crops have reached maturity or the harvest stage.

**CRITERION MEASURE:**

1. The signs of crop maturity are correctly listed.
2. Specified crops are examined and they are correctly determined when they are ready for harvest.

**TASK # JJ560:** Evaluate influence stage of maturity has on quality and value.

**COMPETENCY:** Determine the influence that the stage of maturity has on quality and value of farm crops.

**CRITERION MEASURE:**

1. The effect the stage of maturity has on the grade of specified crops is correctly determined.
2. The effect the stage of maturity has on quality and value of specified crops is correctly determined.

TASK # JJ561: Take moisture checks.

COMPETENCY:

1. Take samples of specified crops for testing percentages of moisture.
2. Test samples collected for percentages of moisture.

CRITERION MEASURE:

1. Correct sampling methods are described and demonstrated for obtaining samples of crops to check moisture content.
2. Moisture testing methods are listed and samples are correctly tested for moisture content.
3. Acceptable moisture levels for harvesting specified crops are listed.

TASK # JJ562: Take yield checks.

COMPETENCY: Check the potential yield of fields for specified crops.

CRITERION MEASURE:

1. The procedures for taking samples and checking yields of specified crops are correctly listed and discussed.
2. Size of sample areas is correctly measured.
3. Crop samples are taken following recommended procedures.
4. Sample weights and amounts are correctly calculated and converted to correctly determine potential yields.

TASK # JJ563: Determine field harvesting loss.

COMPETENCY: Determine amount of loss of specified crops due to harvesting methods.

CRITERION MEASURE:

1. Procedures for determining the amount of loss of specified crops due to harvesting methods are correctly described.
2. Amount of crops lost due to harvesting methods are correctly determined by following recommended procedures of measurement.

SUBJECT AREA: Harvesting Crops

TASK # JJ564: Cut stubble for straw.

COMPETENCY: Use a tractor and mower to properly cut stubble for straw.

CRITERION MEASURE:

1. Tractor and mower are properly adjusted and stubble is evenly cut at the recommended height.
2. All safety precautions are observed when operating tractor and mower.

TASK # JJ565: Bale straw and forage crops.

COMPETENCY: Bale straw and forage crops by correctly and safely operating baler and tractor.

CRITERION MEASURE:

1. Baler is properly hitched to the tractor and adjusted according to the operator's manual.
2. Straw and forage crops are properly baled by the correct and safe operation of the baler and tractor.
3. Bales are the correct weight and size and are compacted tightly.
4. Adjustments on the baler are made as needed to bale different types of straw and forage crops.

TASK # JJ566: Cut forages for green chop feeding.

COMPETENCY: Cut forages for green chop feeding at the proper time by correctly and safely operating forage cutting machinery and tractors.

CRITERION MEASURE:

1. Correct determination is made for the appropriate time to cut forages for green chop feeding.
2. Forage cutters are correctly attached to tractors and proper adjustments are made to the cutters for efficient cutting.
3. Tractors and forage cutters are operated correctly and safely according to operators' manuals.
4. Forage cutters are correctly adjusted for the type of forage to be cut.
5. Forages are cut at the correct height and are cut evenly over the field with little or no waste.

**TASK # JJ567:** Cut forages for silage.

**COMPETENCY:** Cut forages for silage at the proper time by correctly and safely operating silage choppers and tractors.

**CRITERION MEASURE:**

1. Correct determination is made for the appropriate time to cut forages for silage.
2. Silage choppers are correctly attached to tractors and proper adjustments are made to the choppers for efficient cutting.
3. Tractors and silage choppers are operated correctly and safely according to operators' manuals.
4. Silage choppers are correctly adjusted for the type of forage to be cut.
5. Forages are cut at the correct height and are cut evenly over the field with little or no waste.

**TASK # JJ568:** Determine amount of acreage to be cut at one time.

**COMPETENCY:** Determine how many acres of crops can be efficiently handled at one harvesting.

**CRITERION MEASURE:**

1. The factors to consider for determining the number of acres of crops that can be efficiently cut at one harvesting are correctly listed and discussed.
2. The number of acres recommended to be harvested at one cutting is realistic in terms of the factors involved and the particular farming operations.

**TASK # JJ569:** Determine number of cuttings to be harvested.

**COMPETENCY:** Determine the number of cuttings that may be taken from specific crops.

**CRITERION MEASURE:**

1. The recommended number of cuttings for specific crops under normal growth conditions are correctly determined.
2. The factors that influence the number of cuttings for specific crops are correctly listed and discussed.
3. Specific crops are examined and the recommended number of cuttings to be made is logical based on the factors involved.

TASK # JJ570: Determine when hay is "field cured" and ready to bale.

COMPETENCY: Decide when cut hay is in the proper cured condition to be baled.

CRITERION MEASURE:

1. The proper condition that different types of hay should be in when they are ready for baling is described.
2. Different types of hay are examined and correct determinations are made when they are in the correct condition for baling.
3. Effects of baling hay when hay is not properly cured are correctly described.

TASK # JJ571: Determine when vegetables should be harvested during the day.

COMPETENCY: Determine the best time of day when specified types of vegetables should be harvested.

CRITERION MEASURE:

1. The factors that influence when vegetables should be harvested during the day are correctly listed and discussed.
2. Times during the day when specified types of vegetables should be harvested are correctly listed.

TASK # JJ572: Identify harvesting practices which affect quality.

COMPETENCY: Identify harvesting practices that affect the quality of the crop.

CRITERION MEASURE:

1. Recommended harvesting methods for specified crops are correctly listed.
2. Harvesting practices that affect crop quality are correctly listed and discussed.
3. Results of improper harvesting practices are correctly determined and discussed.
4. Correct harvesting practices for specified crops are recommended.

TASK # KK573: Control temperature and humidity in storage areas.

COMPETENCY: Adjust thermostats and controls to regulate temperature and humidity in crop storage areas.

CRITERION MEASURE:

1. Temperature and humidity requirements for specified crops in storage are correctly listed.
2. Required temperature and humidity levels in crop storage areas are set and maintained.
3. Operation and adjustments of thermostats, fans, heaters, and other controls in crop storage areas are correctly demonstrated.

TASK # KK574: Determine moisture content of stored crops.

COMPETENCY: Take samples of stored crops and run appropriate tests to determine the moisture content of the crops.

CRITERION MEASURE:

1. Techniques for taking samples of stored crops to determine the moisture content are correctly described and demonstrated.
2. Testing procedures for determining the moisture content of specified crops are correctly demonstrated.
3. Samples of specified crops are taken and correct moisture contents are obtained.

TASK # KK575: Determine safe moisture content for storing.

COMPETENCY: Determine the moisture level that will be safe for specified crops.

CRITERION MEASURE: The moisture level at which specified crops are suitable for safe storage are correctly listed.

**TASK # KK576:** Estimate amount of crops in storage.

**COMPETENCY:** Estimate the amount of crops that are stored at any one time on the farm.

**CRITERION MEASURE:**

1. Procedures for estimating the amount of specified crops that are stored are correctly described.
2. Amount of specified crops in storage are correctly estimated.

**TASK # KK577:** Estimate amount of storage space needed.

**COMPETENCY:** Estimate the amount of storage space that will be needed for crops that are to be harvested or purchased.

**CRITERION MEASURE:**

1. Factors to consider when estimating the amount of storage space needed for crops are correctly listed and discussed.
2. Yields of specified crops are estimated and the amounts of storage space needed are correctly determined.

**TASK # KK578:** Evaluate influence moisture has on quality.

**COMPETENCY:** Evaluate the influence that moisture has on the quality of stored crops.

**CRITERION MEASURE:**

1. The improper levels of moisture on the quality of stored influence of crops is correctly discussed.
2. Stored crops are examined and the influence improper moisture levels is correctly determined.

**TASK # KK579:** Identify storage problems that might occur.

**COMPETENCY:** Identify problems that might occur in storing farm crops.

**CRITERION MEASURE:** Various problems that may occur in storing farm crops are identified and discussed.

**TASK # KK580:** Remove damaged crops from storage.

**COMPETENCY:** Identify and remove damaged crops from storage.

**CRITERION MEASURE:**

1. Types of damage that may occur to crops in storage are listed.
2. Damaged crops in storage are positively identified.
3. Damaged crops are properly removed from storage manually and by correctly using tractors, augers, and other mechanized equipment.
4. Reasons for removing damaged crops from storage are correctly listed.

**TASK # KK581:** Use grain dryer and fans.

**COMPETENCY:** Operate grain dryers and fans following recommended procedures to dry grain to specified moisture percentages.

**CRITERION MEASURE:**

1. Grain dryers and fans are correctly adjusted and operated following procedures found in operators' manuals.
2. Maintenance procedures for grain dryers and fans are correctly described and demonstrated.
3. Grain is properly dried to specified moisture percentages.

**TASK # KK582:** Use proper types of storage facilities.

**COMPETENCY:** Select and use proper types of storage facilities for specified crops.

**CRITERION MEASURE:**

1. Features of various storage facilities that are desirable for different types of crops are correctly described.
2. Sources where information may be obtained on types of storage facilities available for specified crops are determined.
3. Storage capacities of various types of facilities are correctly determined.
4. Storage facilities are selected that meet storage requirements of specified crops and are economically feasible.
5. Storage facilities are properly maintained and used.

**TASK # KK583:** Stack bales properly.

**COMPETENCY:** Stack bales in storage facilities using stacking techniques that makes the maximum utilization of available space.

**CRITERION MEASURE:**

1. Methods of stacking bales in barns and other facilities are described and demonstrated.
2. The maximum number of bales are properly stacked in specified amounts of space in different storage facilities.

**TASK # KK584:** Fill silo.

**COMPETENCY:** Operate silage blowers to fill silos without wasting or losing an excessive amount of silage.

**CRITERION MEASURE:**

1. Proper operation of different silage blowers is demonstrated.
2. Silage blowers are correctly operated to properly fill different size silos.
3. Excessive amount of silage is not wasted or lost during operation of silage blowers.
4. All safety precautions are observed during operation of silage blowers.

**TASK # KK585:** Supply additives as silage is blown into silo.

**COMPETENCY:**

1. Add additives to silage in the correct proportions.
2. Add additives to silage at the proper time in the filling operation.
3. Use the correct types of additives.

**CRITERION MEASURE:**

1. The proper types and amounts of additives are supplied to silage during the filling operation.
2. The correct times to add additives are described and are supplied during the actual filling operation.
3. Reasons for using additives are correctly listed and discussed.

## SUBJECT AREA: Storing Crops

**TASK # KK586:** Cure vegetables prior to storage.

**COMPETENCY:**

1. Cure vegetables at the proper temperatures and for the proper amount of time before putting them in storage.
2. Operate burners or heaters for the curing process.

**CRITERION MEASURE:**

1. Proper temperatures for curing specified vegetables are determined.
2. Proper amounts of time that specified vegetables should be cured are correctly determined.
3. Operation techniques for burners and heaters are correctly described and demonstrated.
4. Characteristics of properly cured vegetables are described.
5. Specified vegetables are properly cured following recommended procedures.

**TASK # KK587:** Determine length vegetables may be stored.

**COMPETENCY:**

1. Determine how long various types of vegetables should be able to be stored.
2. Check condition of vegetables while in storage to determine possibility of further storage or removal.

**CRITERION MEASURE:**

1. Normal storage times for specified vegetables are correctly listed.
2. Conditions of vegetables that might necessitate removal from storage are described.
3. Specified vegetables in storage and periodically checked and vegetables that need to be removed are correctly identified.

**TASK # KK588:** Determine light intensity in storage areas.

**COMPETENCY:** Determine the light intensity required in storage areas for proper storage of specified crops.

**CRITERION MEASURE:**

1. The recommended light intensity in storage areas for specified crops is correctly determined and listed.
2. Storage areas are periodically checked and appropriate and inappropriate light intensities are identified.

## SUBJECT AREA: Storing Crops

**TASK # KK589:** Check physical condition to determine storability.

**COMPETENCY:** Check the physical condition of specified crops to determine their storability.

**CRITERION MEASURE:**

1. Conditions of crops that affect storability are correctly listed and discussed.
2. Crops are checked and the storability of them is correctly determined.

SUBJECT AREA: Tobacco Plant Bed Preparation

TASK # LL590: Select bed site.

COMPETENCY: Evaluate and select a plant bed site for good seed germination and seedling growth.

CRITERION MEASURE:

1. The factors to consider in selecting a tobacco plant bed site are listed and discussed.
2. Site selected has rich, loamy soil, and will produce quality tobacco plants.
3. Site selected is convenient, has wind breaks, and a southern exposure, available water, and can be drained.

TASK # LL591: Select profitable variety of tobacco.

COMPETENCY: Determine and select best tobacco variety for planting based on the farm's characteristics.

CRITERION MEASURE:

1. The factors to consider in selecting tobacco varieties are listed and adequately described.
2. Variety has been tested and certified.
3. Tobacco is of high quality and in demand.
4. Variety is suited to the area's climate and soil conditions.
5. Variety is adaptable to the farm's crop rotation program and facilities.

TASK # LL592: Treat soil with soil fumigant to control pests and weeds.

COMPETENCY:

1. Rake the plant bed site with hand rake.
2. Place hoses and applicators on bed site.
3. Spread plastic cover over the bed and secure edges by placing in a trench and covering with dirt.
4. Place fumigant cans into the applicator opener and open, thereby releasing fumigant under plastic cover.
5. After specified time period, remove plastic cover.

CRITERION MEASURE:

1. Equipment is operated correctly for fumigant application.
2. Conditions are favorable and fumigant is applied according to label instructions.
3. A proper cover is used to cover plant bed site and the bed is covered properly.
4. Fumigant controls desired pests and weeds by leaving plastic cover on recommended period of time.

SUBJECT AREA: Tobacco Plant Bed Preparation

**TASK # LL593:** Broadcast proper analysis and amount of fertilizer.

**COMPETENCY:** Broadcast amount and right analysis of fertilizer uniformly over the bed by hand and by tractor mounted spreader.

**CRITERION MEASURE:**

1. Correct fertilizer analysis and rate are recommended based on soil test results.
2. Fertilizer is broadcast uniformly over the bed by hand or mechanical means.
3. Equipment is properly used and operated according to manufacturer's recommendations.
4. Fertilizer is applied and properly raked in before seeding.

**TASK # LL594:** Seed the plant bed.

**COMPETENCY:** Apply tobacco seed uniformly over plant bed by hand and by cyclone type seeder.

**CRITERION MEASURE:**

1. Seeds are mixed with carrier uniformly.
2. The seeding rate is based on recommendations.
3. Seeds are evenly distributed over the bed by hand and by using cyclone type seeder.
4. Favorable conditions for seeding are listed.

**TASK # LL595:** Dig drainage ditches.

**COMPETENCY:** Construct drainage ditches around tobacco plant beds to drain off excess water.

**CRITERION MEASURE:**

1. The reasons for proper drainage of plant beds are listed.
2. Ditches are located around the perimeter of plant bed.
3. Ditches are dug approximately one foot wide and one-half foot deep.
4. Ditches outlet to a lower area.
5. Proper equipment is used and safety precautions are observed.

**TASK # LL596:** Select and use proper bed cover.

**COMPETENCY:** Determine the proper bed cover and place it over the bed in a satisfactory manner.

**CRITERION MEASURE:**

1. Bed cover is of quality recommended for the geographic area.
2. Cover is placed over bed and secured by pegging or nailing to edges to prevent wind damage.
3. Cover is placed approximately three inches above ground to allow for plant growth and to provide greenhouse effect.

**TASK # LL597:** Apply treatment for mold.

**COMPETENCY:** Apply fungicides for prevention or control of tobacco molds.

**CRITERION MEASURE:**

1. Fungicides are chosen that are recommended for a treatment of molds harmful to tobacco.
2. Application is made at the rate recommended.
3. Uniform application is made to all areas of the bed.
4. Equipment is properly used and all safety precautions are observed.

**TASK # LL598:** Identify and apply chemicals for plant bed diseases.

**COMPETENCY:** Identify plant bed diseases and apply appropriate chemicals for control.

**CRITERION MEASURE:**

1. Plant bed diseases are correctly identified by visual inspection and by using resource materials.
2. Chemicals selected are recommended for plant beds and for the diseases to be treated.
3. The application is made according to manufacturer's recommendation.
4. Equipment is properly used and all safey precautions are observed.

## SUBJECT AREA: Tobacco Plant Bed Preparation

**TASK # LL599:** Weed the bed.

**COMPETENCY:** Identify weeds, pull from plant bed, and dispose of weeds properly.

**CRITERION MEASURE:**

1. Reasons for removing weeds from tobacco plant beds are listed.
2. Plant bed weeds are correctly identified.
3. Weeds are pulled from among the tobacco plants, causing minimum damage to the tobacco plants.
4. After weeding, tobacco beds are free of weeds.
5. Weeds are discarded in a proper manner.

**TASK # LL600:** Irrigate the bed.

**COMPETENCY:** Apply water uniformly over the bed as needed by the tobacco plants.

**CRITERION MEASURE:**

1. The determination of when to irrigate is correctly made.
2. Irrigation equipment is set up correctly and positioned to insure maximum use of water.
3. Application is made at a rate equal to absorption rate of the soil.
4. Uniform application is made to all areas of the bed.
5. Irrigation is stopped before saturation and runoff occurs.

**TASK # LL601:** Spray bed for worms.

**COMPETENCY:** Identify worms in the bed, select appropriate insecticide, and spray insecticide over the bed uniformly and at the recommended rate.

**CRITERION MEASURE:**

1. Worms are correctly identified that attack tobacco plant beds.
2. Appropriate insecticide is chosen for treatment of insect larva harmful to tobacco.
3. Equipment is calibrated and adjusted properly.
4. Application is made at the rate recommended.
5. Uniform application is made to all areas of the bed.
6. All safety precautions are observed.

SUBJECT AREA: Tobacco Cultural Practices

**TASK # MM602:** Treat land for nematodes and apply pre-emergent herbicides and fertilizers.

**COMPETENCY:** Select appropriate nematicides, pre-emergent herbicides, and fertilizers, and apply materials evenly over the field using appropriate equipment.

**CRITERION MEASURE:**

1. Appropriate nematicides, pre-emergent herbicides, and fertilizers are selected.
2. Equipment is calibrated and operated correctly.
3. Amount of nematicide, herbicide, and fertilizer used are based on soil sample results and/or recommendations.
4. Application is made at recommended rate.
5. Application is broadcast or banded uniformly to all areas of the tobacco field.
6. All safety precautions are known and observed.

**TASK # MM603:** Select proper size transplants.

**COMPETENCY:** Select matured transplants for best survival and remove plants from bed.

**CRITERION MEASURE:**

1. Factors used in selecting transplants are listed.
2. Transplants are selected that are healthy, mature, and 6-8 inches tall.
3. Transplants are removed from bed without damage.

**TASK # MM604:** Transplant tobacco.

**COMPETENCY:** Transplant tobacco plants in the field using a tractor-drawn transplanter.

**CRITERION MEASURE:**

1. The types and operation procedures of transplanters are listed and discussed.
2. All equipment is adjusted and operated correctly and safely.
3. Plants are placed on bedded rows.
4. Plants are evenly spaced on the rows.
5. Plant roots are approximately two inches deep and soil is pressed around roots.

**TASK # MM605:** Apply top dressing.

**COMPETENCY:** Apply correct amount and type of top dressing evenly and near the tobacco plants.

**CRITERION MEASURE:**

1. Equipment is calibrated and operated correctly.
2. Analysis and amount of top dressing is chosen based on test results.
3. Application is made at early stage of rapid growth phase.
4. Top dressing is placed near the plant roots.

**TASK # MM606:** Cut tops from tobacco.

**COMPETENCY:** Uniformly remove tops from tobacco plants.

**CRITERION MEASURE:**

1. Tops are cut off at early mature stage (at blossom) by hand and by tractor mounted cutters.
2. Damage to upper stalk and leaves is minimized.
3. Tractor mounted toppers are adjusted correctly to uniformly remove only the blossom parts.

**TASK # MM607:** Remove suckers and spray to prevent further growth.

**COMPETENCY:**

1. Identify tobacco suckers and remove suckers by hand.
2. Spray tobacco plants with sucker control chemicals by using tractor mounted or self-propelled sprayer.

**CRITERION MEASURE:**

1. Tobacco suckers are positively identified and suckers are cleanly removed.
2. Sprayers are calibrated correctly to apply recommended rates of chemicals to plants.
3. Equipment is operated correctly and safely.
4. Appropriate chemical is selected and material is applied evenly and at the recommended rate.
5. Spray material reaches all suckering parts.

SUBJECT AREA: Tobacco Cultural Practices

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| TASK # MM608: | Cultivate tobacco. |
| COMPETENCY: | Cultivate tobacco evenly and smoothly with tractor. |
| CRITERION MEASURE: | 1. Reasons for cultivation are listed.<br>2. Tractor is centered on row and speed is adjusted according to plant size.<br>3. Cultivators are properly adjusted to plow all the area evenly approximately 2-3 inches deep.<br>4. All weeds and grass are removed between rows.<br>5. Soil is loose and aerated.<br>6. Plow damage to stalks is minimum.<br>7. Plants are not covered up. |

**TASK # NN609:** Determine most profitable method of harvesting.

**COMPETENCY:** Determine the most profitable method of harvesting tobacco based on tobacco acreage and farm's characteristics.

**CRITERION MEASURE:**

1. The factors used to determine the most profitable method of harvesting tobacco are listed and adequately explained.
2. Practical situations are analyzed by using economic and other factors and proper decisions are made concerning harvesting methods to use.

**TASK # NN610:** Determine proper ripeness.

**COMPETENCY:** Determine if leaf is ripe and ready for harvest.

**CRITERION MEASURE:**

1. The characteristics used to determine leaf ripeness are listed and explained.
2. Samples of leaves are examined and degree of ripeness is accurately provided.

**TASK # NN611:** Determine most profitable method of curing.

**COMPETENCY:** Determine the most profitable method of curing harvested tobacco.

**CRITERION MEASURE:**

1. The factors used to determine the most profitable method of curing tobacco are listed and adequately explained.
2. Types of curing systems available are listed and advantages and disadvantages are listed.

SUBJECT AREA: Tobacco Harvesting, Curing, and Storage

TASK # NN612: Maintain yellowing heat in barn.

COMPETENCY: Operate and adjust the heat system's controls to maintain approximately 100°F during the yellowing phase of curing.

CRITERION MEASURE:

1. The heat control system is operated correctly to maintain approximately 100°F during the yellowing phase.
2. The factors affecting the yellowing process are listed and correctly explained.
3. The wet-bulb, thermometer is read correctly and its operation is explained.

TASK # NN613: Increase heat to dry the leaf and stems.

COMPETENCY: Operate and adjust the heat system's controls to increase heat at the end of the yellowing phase to dry out the leaves and stems.

CRITERION MEASURE:

1. The heat control system is operated correctly to increase the heat to dry the leaves and stems.
2. The time to add heat and the rate of increased heat is correctly determined.
3. It is recognized when heat is being supplied too fast or too slow.
4. It is correctly determined when tobacco leaves and stems are killed out.
5. Tobacco remains yellow at the end of the increased heat period.

TASK # NN614: Return moisture to prevent shattering.

COMPETENCY: Return moisture to cured out tobacco leaves in order to prevent shattering.

CRITERION MEASURE:

1. Methods of allowing moisture to return to tobacco leaves are properly used.
2. Tobacco does not shatter when it is removed from curing barn.
3. No rotting or heat buildup is encountered while tobacco is in storage.

TASK # NN615: Determine proper method of storage.

COMPETENCY: Determine an adequate method of storing the tobacco that will protect and maintain the quality of the cured tobacco.

CRITERION MEASURE:

1. Tobacco is adequately protected from the elements.
2. Tobacco quality is maintained during storage.
3. The storage area is of adequate size for the tobacco acreage.

TASK # NN616: Maintain dry and pest-free storage facilities.

COMPETENCY: Maintain storage facility to prevent excessive moisture or pest damage.

CRITERION MEASURE:

1. Types of damage to tobacco due to excess moisture in storage are listed.
2. Damage that may be caused by pests is listed and described.
3. Methods to maintain tobacco storage facilities to prevent excessive moisture or pest damage are provided.

TASK # NN617: Use a wet-bulb thermometer to help regulate ventilation.

COMPETENCY: Regulate ventilation based on wet-bulb thermometer readings.

CRITERION MEASURE:

1. Wet-bulb thermometer is read correctly.
2. Humidity is correctly determined by using wet-bulb thermometer readings.
3. Ventilation is adjusted to insure proper air flow.

SUBJECT AREA: Tobacco Harvesting, Curing, and Storage

TASK # NN618: Transport tobacco to curing barns.

COMPETENCY:
1. Determine the best and most efficient method of transporting tobacco from field to curing barn.
2. Transport tobacco from field to curing barn.

CRITERION MEASURE:
1. Factors affecting transporting tobacco from field to curing barns are correctly listed.
2. Least-cost method of transporting the tobacco is calculated based on given factors.
3. Tobacco is transported without damage.
4. Transportation is orderly and timely.
5. Most efficient and safest means of transportation available are utilized.

TASK # NN619: String tobacco on sticks or place in bulk racks or boxes.

COMPETENCY: String tobacco on curing sticks or place tobacco into bulk racks or boxes.

CRITERION MEASURE:
1. Factors involved in determining the method to use in preparing tobacco for curing are correctly provided.
2. Tobacco is strung on curing sticks following recommended procedures.
3. Tobacco does not fall off sticks or from racks or boxes.
4. Tobacco is packed in bulk boxes evenly and a uniform amount of tobacco is in each box.
5. Tobacco is placed in bulk racks uniformly with all ends in the same direction.

TASK # NN620: Hang sticks on tiers or place bulk containers properly in barn.

COMPETENCY: Hang sticks of strung tobacco on barn tiers or place containers on racks in bulk curing barns.

CRITERION MEASURE:
1. Sticks of tobacco are properly placed on tiers with the leaves touching those on adjacent stick but not too tightly.
2. Sticks do not fall from tiers or containers do not spill.
3. Containers are placed on racks in bulk barn and each container is tight against adjacent container.

**TASK # 00621:** Determine best market and warehouse.

**COMPETENCY:** Determine the best market and warehouse to sell the tobacco.

**CRITERION MEASURE:**
1. Markets located in the area are identified.
2. Good market and warehouse characteristics are listed.
3. Average selling prices at specified markets are correctly determined for the last three years.

**TASK # 00622:** Prepare the tobacco for marketing.

**COMPETENCY:** Prepare the cured and stored tobacco for marketing.

**CRITERION MEASURE:**
1. Government grading system is adequately described.
2. Tobacco is graded and sorted according to market demand.
3. Tobacco is prepared without harm to quality.

**TASK # 00623:** Determine optimum time to sell different grades.

**COMPETENCY:** Determine when to sell tobacco during the marketing season based on the way various grades are selling.

**CRITERION MEASURE:** The factors involved in determining when to sell different grades of tobacco are listed and discussed.

**TASK # 00624:** Properly sheets tobacco.

**COMPETENCY:** Pack and sheet tobacco in preparation for delivery to market.

**CRITERION MEASURE:**
1. Tobacco is packed and sheeted according to marketing rules.
2. Quality is not harmed during packing and sheeting.

**TASK # 00625:** Deliver tobacco to warehouse.

**COMPETENCY:** Load, transport, and deliver tobacco to selling warehouse.

**CRITERION MEASURE:**

1. Tobacco is loaded on trucks using proper equipment safely and efficiently.
2. Trucks are driven safely and tobacco is delivered to warehouse without damage.
3. Canvas and ropes are used efficiently for securing tobacco on trucks.

**TASK # 00626:** Has tobacco weighed in.

**COMPETENCY:**

1. Place individual sheets of tobacco on warehouse scales, observe weight shown, and check weight recorded by scaleman on selling tag.
2. Attach tag to sheet of tobacco and carry to assigned selling space.

**CRITERION MEASURE:**

1. Sheets of tobacco are properly placed on scales, correct weight recorded on tags, and tags are properly placed on sheets.
2. Sheets are orderly aligned on warehouse floor by assigned space number.

**TASK # 00627:** Observe government graders.

**COMPETENCY:** Observe grades given to piles of tobacco by government graders to determine correctness and consistency of grades.

**CRITERION MEASURE:**

1. The established criteria for grades are listed.
2. Grading techniques are provided and discussed.
3. Grades recorded by government graders are consistent.
4. Grades are in keeping with established criteria.
5. Errors in grading are called to the attention of the grader in a diplomatic manner.
6. Support prices assigned to each grade are listed.

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| TASK # 00628: | Determine whether to accept price or keep the tobacco and sell it at a later date. |
| COMPETENCY: | Accept or reject the price offered by the buyer. |
| CRITERION MEASURE: | The factors used in deciding whether to accept or reject the price offered by the buyer are listed and adequately described. |

SUBJECT AREA: Preparing the Greenhouse Growing Medium

**TASK # PP629:** Determine appropriate soil mix for specific plants.

**COMPETENCY:** Select soil mix for selected plants.

**CRITERION MEASURE:** The soil mix for selected plants is correctly determined for optimum plant growth.

**TASK # PP630:** Determine soil texture.

**COMPETENCY:** Determine the soil texture for selected samples of soils.

**CRITERION MEASURE:**

1. The types of soil texture are listed with characteristics given for each type.
2. The soil texture for selected soil samples is correctly identified.

**TASK # PP631:** Evaluate physical, chemical, and biological effects steam has on soil.

**COMPETENCY:** Determine the physical, chemical, and biological effects steam has on soil.

**CRITERION MEASURE:** The physical, chemical, and biological effects that steam has on soil are correctly listed and explained.

**TASK # PP632:** Fill benches and pots.

**COMPETENCY:** Fill benches and pots with soil mix.

**CRITERION MEASURE:**

1. Benches and pots are filled with soil mix to the specified level and firmed.
2. Tools and equipment are used properly, efficiently, and safely.

**TASK # PP633:** Fill soil bins.

**COMPETENCY:** Fill soil bins with soil media using appropriate tools and equipment.

**CRITERION MEASURE:**
1. Soil bins are filled with soil media without overfilling, damaging the bins, or mixing the media materials.
2. Tools and equipment are used efficiently and safely.

**TASK # PP634:** Identify greenhouse soil materials.

**COMPETENCY:** Visually identify the various types of media materials and list the characteristics of each type.

**CRITERION MEASURE:**
1. Types of media materials are correctly identified visually.
2. Characteristics of the various types of media materials are listed correctly.

**TASK # PP635:** Level soil surface.

**COMPETENCY:** Level the soil surface in benches, pots, and flats by using hands, tools, or sticks.

**CRITERION MEASURE:** The soil surface in benches, pots, and flats is uniformly level at a specified depth.

**TASK # PP636:** Mark soil for planting.

**COMPETENCY:** Make rows in the soil in flats and benches using a small stick or other object.

**CRITERION MEASURE:**
1. The rows are at the appropriate depth for the type of seed to be planted.
2. The rows are uniform in width, depth, and spacing between rows.

**TASK # PP637:** Mix soil with appropriate plant growing materials.

**COMPETENCY:**

1. Select appropriate plant growing materials, i.e., fertilizer, soil conditioners, etc. for type plants to be grown.
2. Mix soil and plant growing materials by hand or mechanically.

**CRITERION MEASURE:**

1. Plant growing materials are selected that best meet the requirements for specified plants.
2. The soil and plant growing materials are uniformly. mixed.
3. Soil mixture is free of lumps, individual ingredients, or foreign material.
4. Mechanical equipment is operated according to manufacturer's recommendations.
5. Shovels, rakes, and hoes are used correctly, efficiently, and safely.

**TASK # PP638:** Prepare compost.

**COMPETENCY:** Prepare compost using recommended materials and following established procedures.

**CRITERION MEASURE:** Compost is prepared correctly following established procedures.

**TASK # PP639:** Shred or screen soil.

**COMPETENCY:** Shred and screen soil.

**CRITERION MEASURE:**

1. Soil and media materials are properly shredded by using hand tools and mechanical equipment.
2. Soil and media materials are screened for sizing by using hand and mechanical screeners.
3. Foreign materials are identified and removed from soil and media materials.
4. Hand tools are used properly, efficiently, and safely.
5. Mechanical equipment is operated according to manufacturer's recommendations.

**TASK # PP640:** Spread peat moss on top of soil mix.

**COMPETENCY:** Spread peat moss on top of soil mix uniformly and at the appropriate depth for good seed germination.

**CRITERION MEASURE:**

1. Peat moss is spread uniformly on top of soil mix.
2. Peat moss is spread at the correct depth for the type of seed sown.
3. All lumps are removed from the peat moss.

**TASK # PP641:** Steam soil.

**COMPETENCY:** Sterilize soil mixtures using steam.

**CRITERION MEASURE:**

1. Recommended procedures for the steam sterilization method are followed.
2. Soil media sterilized with steam results in no weed growth and no root diseases.

**TASK # PP642:** Sterilize mixed soils with chemicals and heat.

**COMPETENCY:** Sterilize soil mixtures using chemicals and heat.

**CRITERION MEASURE:**

1. Recommended procedures for the chemicals and heat sterilization methods are followed.
2. Soil media is sterilized correctly resulting in no weed growth and no root diseases.

**TASK # QQ643:** Alter spacing of plants.

**COMPETENCY:** Change the spacing of plants to accommodate plant sizes and spacing requirements for different plant species.

**CRITERION MEASURE:**

1. Plant spacing requirements for different plant species are listed.
2. The methods for changing plant spacing are provided and correctly carried out without damaging plants.

**TASK # QQ644:** Apply shading compound to glass.

**COMPETENCY:** Glaze windows on greenhouses to prevent plants from receiving too much direct sun.

**CRITERION MEASURE:**

1. Glazing materials are correctly identified.
2. Glazing materials are selected that are best for selected greenhouses and plants that are grown.
3. Proper tools and equipment are selected, used correctly, and cleaned after use.
4. Glazing materials are properly and evenly applied.

**TASK # QQ645:** Basin plants for watering.

**COMPETENCY:** Prepare a mound or basin around plants to assist in holding moisture.

**CRITERION MEASURE:** Mound or basin is properly constructed around plants to hold moisture.

SUBJECT AREA: Managing and Controlling the Greenhouse Environment

TASK # QQ646: Control air temperature.

COMPETENCY: Control temperature in the greenhouse by using drip pads and by operating fans and heaters manually and by setting automatic timers.

CRITERION MEASURE:

1. Temperature requirements (day/night) are correctly determined for selected plants.
2. Drip pads are operated following recommended procedures.
3. Correct temperatures are maintained by manual operation and setting of automatic timers for fans and heaters.

TASK # QQ647: Control humidity.

COMPETENCY: Control humidity with ventilating fans and humidifiers by operating equipment manually and by setting automatic timers.

CRITERION MEASURE:

1. Proper relative humidity level is determined for selected plants.
2. Proper relative humidity level is maintained by manual operation and setting of automatic timers for ventilating fans and humidifiers.

TASK # QQ648: Control light quantity and quality.

COMPETENCY: Control the type and amount of light necessary for greenhouse plant production.

CRITERION MEASURE:

1. Light requirements for greenhouse crops are provided.
2. Light meters are correctly read.
3. Shade cloth is used at the correct time to control the amount of light required for selected greenhouse crops.
4. Glazing compound is used on glass greenhouses to protect plants from excessive light.
5. Artificial lighting (incandescent and fluorescent) is properly used to control the type, amount, and length of daylight required for selected greenhouse crops.

SUBJECT AREA: Managing and Controlling the Greenhouse Environment

**TASK # QQ649:** Determine appropriate temperatures for various plants.

**COMPETENCY:** Determine appropriate temperatures for selected plants by recall or by using resource materials.

**CRITERION MEASURE:**

1. Resource materials are correctly used in determining temperature requirements for selected plants.
2. Temperature requirements for selected plants are provided from recall or by using resource materials.

**TASK # QQ650:** Evaluate effect temperature has on plant growth.

**COMPETENCY:** Determine the effect temperature has on plant growth by setting up several controlled experiments using different temperatures on selected plants.

**CRITERION MEASURE:**

1. Controlled temperature experiments are set up following recommended procedures for experimentation.
2. Differences in plant growth resulting from different temperatures are correctly recorded.

**TASK # QQ651:** Evaluate influence relative humidity has on plant growth.

**COMPETENCY:** Determine the effect relative humidity has on plant growth by setting up several controlled experiments using different relative humidity readings on selected plants.

**CRITERION MEASURE:**

1. Controlled relative humidity experiments are set up following recommended procedures for experimentation.
2. Differences in plant growth resulting from various relative humidity readings are correctly recorded.

**TASK # QQ652:** Hang lath or saran cloth.

**COMPETENCY:** Prepare shade for plants by constructing lath houses using snow fencing or saran cloth.

**CRITERION MEASURE:**

1. Lath houses are laid out in a good location following recommended procedures.
2. Poles are set firmly and in a vertical position.
3. Adequate bracing is provided.
4. Snow fencing or saran cloth is hung to provide proper shade.

**TASK # QQ653:** Interpret light meter.

**COMPETENCY:** Read and interpret a light meter.

**CRITERION MEASURE:**

1. The light meter is properly adjusted to obtain a correct reading.
2. The light meter is read and interpreted correctly.

**TASK # QQ654:** Mist plants.

**COMPETENCY:** Mist plants using manual or automatic misting systems.

**CRITERION MEASURE:**

1. Misting requirements for selected plants are correctly provided.
2. Plants are misted manually providing adequate amounts of mist at correct intervals of time.
3. Plants are misted by using an automatic misting system set correctly to provide adequate amounts of mist at correct intervals of time.

**TASK # QQ655:** Set automatic water timers.

**COMPETENCY:** Set automatic water timers at predetermined periods of time.

**CRITERION MEASURE:** Automatic water timers are set correctly to provide water to plants according to predetermined schedules.

*SUBJECT AREA:* *Managing and Controlling the Greenhouse Environment*

**TASK # QQ656:** Water greenhouse plants.

**COMPETENCY:** Water greenhouse plants manually and by using automated equipment.

**CRITERION MEASURE:**

1. Water requirements for selected greenhouse plants are provided.
2. Schedules for adequately watering various types of greenhouse stock are developed.
3. Plants are watered manually providing adequate amounts of water and without damaging plants.
4. Automatic timers are set correctly according to established watering schedules.
5. Water conservation practices are followed.

**TASK # QQ657:** Set automatic light timers.

**COMPETENCY:** Set automatic light timers at predetermined periods of time.

**CRITERION MEASURE:** Automatic light timers are set correctly to provide light to plants according to predetermined schedules.

SUBJECT AREA: Using Service and Operator's Manuals

**TASK # RR658:** Locate proper specifications for equipment.

**COMPETENCY:** Locate, read, and interpret specifications for farm equipment from operator's manuals.

**CRITERION MEASURE:**
1. Operator's manuals are used correctly and efficiently to locate specifications for farm equipment.
2. Specific specifications are located, read, and interpreted correctly.

**TASK # RR659:** Interpret sketches and diagrams.

**COMPETENCY:** Interpret the sketches and diagrams that are given for the operation, maintenance, or repair of farm equipment.

**CRITERION MEASURE:**
1. Sketches and diagrams given for the operation, maintenance and repair of farm equipment are verbally explained or illustrated.
2. Specified equipment is maintained and repaired correctly following sketches and diagrams.

**TASK # RR660:** Follow written repair procedures.

**COMPETENCY:** Follow the written instructions that are provided for the repair of farm machinery and equipment.

**CRITERION MEASURE:**
1. Written repair procedures are read and verbally explained.
2. Specified farm equipment is correctly repaired using written repair procedures.

**TASK # SS661:** Determine how breakages or defects in specific parts influence overall operation of equipment.

**COMPETENCY:** Determine how overall operation of equipment is affected by defective or broken parts.

**CRITERION MEASURE:**

1. Inefficient operation of equipment is recognized.
2. Reason(s) for inefficient operation is identified.
3. Defective and/or broken parts are identified and inefficient operation of the equipment caused by these parts are explained.

**TASK # SS662:** Determine potential causes of equipment failure.

**COMPETENCY:** Inspect equipment after breakdowns to determine potential causes of equipment failure.

**CRITERION MEASURE:**

1. Suspected or the most likely parts of equipment that might have caused the breakdown are inspected first.
2. Through the process of elimination, the potential causes of equipment failure are positively determined.

**TASK # SS663:** Visually inspect for defects.

**COMPETENCY:** Inspect, recognize, and identify defects by visual inspection.

**CRITERION MEASURE:** Inoperative or faulty parts are identified by visually recognizing the defect.

**TASK # SS664:** Recommend appropriate parts needed to correct equipment malfunctions.

**COMPETENCY:** Recommend replacement parts to correct the reasons for equipment failure.

**CRITERION MEASURE:**

1. Recommended replacement parts are consistent with parts manual number.
2. After installment, replacement parts function according to expectations and equipment functions normally.

**TASK # SS665:** Follow trouble shooting procedure in service manual.

**COMPETENCY:** Follow procedure outlined in service manual to diagnose problems or malfunctions in machinery.

**CRITERION MEASURE:**

1. Appropriate service manuals are selected and manuals are used correctly.
2. Procedure is followed as outlined in service manual.
3. Reasons for machinery malfunctions are identified.

**TASK # SS666:** Run dynamometer test.

**COMPETENCY:** Test for brake horsepower by using dynamometer.

**CRITERION MEASURE:**

1. Dynanometer is attached and adjusted according to recommended procedure.
2. Test is run according to procedure for the specific engine.
3. Test readings are accurately made.
4. Test readings are compared with manufacturer's specifications on the engine and accurate interpretations are made.

**TASK # SS667:** Use oscilloscope and engine analyzer to test engine.

**COMPETENCY:** Check engine performance by attaching oscilloscope and engine analyzer.

**CRITERION MEASURE:**

1. Oscilloscope and engine analyzer are correctly attached to engine.
2. Engine analyzer and oscilloscope are correctly read and performance compared to manufacturer's specifications.
3. Engine malfunctions are correctly diagnosed.

SUBJECT AREA: Inspecting and Diagnosing Malfunctions

TASK # SS668: Use hydraulic system tester on hydraulic system.

COMPETENCY: Test hydraulic oil pressure by attaching tester to the supply and to the return line.

CRITERION MEASURE:

1. Hydraulic system tester is properly attached to the correct lines.
2. The PSI oil pressure for the hydraulic system is correctly determined and the reading is accurately compared with the manufacturer's recommendation.
3. Correct pressure diagnosis is made.

SUBJECT AREA: Repairing and Maintaining the Brake System

TASK # TT669: Adjust mechanical brakes.

COMPETENCY: Locate adjustment screw and manually adjust brakes to proper pedal and tension.

CRITERION MEASURE:
1. Brake linings contact drum at desired pedal travel and pressure.
2. Vehicle stops in a safe and reasonable distance.

TASK # TT670: Adjust power brakes.

COMPETENCY: Adjust power brakes, including hydraulic braking system, by locating and turning adjustment nut on wheel cylinder.

CRITERION MEASURE:
1. Linings do not contact drum until pedal pressure is applied.
2. Vehicle brakes evenly and smoothly when desired pedal pressure is applied.

TASK # TT671: Bleed power brakes.

COMPETENCY: Locate brake fluid bleed lock and open to eliminate air from brake lines.

CRITERION MEASURE:
1. Pedal is not spongy or does not lose firmness when pressure is applied.
2. Vehicle brakes evenly and smoothly when desired pedal pressure is applied.

TASK # TT672: Inspect backing plate, brake disc, pressure plates, and brake pistons.

COMPETENCY: Inspect plate and disc for metal wear. Check pressure pads and lining for percent of wear. Check brake pistons for leakage.

CRITERION MEASURE: Inspections are properly made and wear and leaks are correctly diagnosed.

SUBJECT AREA: Repairing and Maintaining the Brake System

**TASK # TT673:** Replace brake lining.

**COMPETENCY:** Remove old brake lining and install new lining according to established procedures.

**CRITERION MEASURE:**
1. Old brake linings are correctly removed using appropriate tools and procedures.
2. New linings are installed according to manufacturer's diagram.

**TASK # TT674:** Replace brake springs, pins, and/or balls.

**COMPETENCY:** Install springs, pins, and/or balls which were removed from old linings.

**CRITERION MEASURE:**
1. Springs, pins, and/or balls are installed according to manufacturer's diagram using appropriate tools and procedures.
2. Linings and shoes are held in place with the right tension by using springs, pins, and/or balls.

**TASK # TT675:** Remove and install cylinders, shoes, and disk.

**COMPETENCY:** Old cylinders, shoes, and disk are removed and new ones installed following recommended procedures.

**CRITERION MEASURE:**
1. Appropriate cylinders, shoes, and disk replacement parts are selected using appropriate parts manual.
2. New cylinders, shoes, and disk are installed according to manufacturer's diagram using appropriate tools and procedures.

TASK # TT676: Test brakes after adjustment.

COMPETENCY: Test brakes by operating vehicle and observe breaking performance.

CRITERION MEASURE:

1. Vehicle brakes evenly and smoothly when desired pedal pressure is applied.
2. Brake linings contact drum with recommended brake pedal travel.

SUBJECT AREA: Repairing and Maintaining Wheels, Tires, and Tracks

TASK # UU677: Adjust track tension.

COMPETENCY: Adjust track tension by locating adjustment nut inside track and lengthening adjustment rod.

CRITERION MEASURE:

1. Tracks remain tight after adjustment rod is turned out.
2. Track tension is in accordance with manufacturer's recommendation.

TASK # UU678: Adjust wheel bearing.

COMPETENCY: Adjust bearing tension by applying or releasing pressure on axle nut.

CRITERION MEASURE:

1. Wheel bearings are adjusted properly.
2. Wheel free spins easily.
3. Play is correctly diagnosed by moving wheel back and forth on axle.

TASK # UU679: Adjust wheel width.

COMPETENCY: Remove and replace wheels to a specific width or use wheel spacers and move power wheel adjustments.

CRITERION MEASURE:

1. Wheels are moved from an undesirable width to a desirable width following recommended procedures.
2. Wheels are set and aligned to the desired width for the job.
3. The setting and alignment correspond to manufacturers' recommendations.

SUBJECT AREA: Repairing and Maintaining Wheels, Tires, and Tracks

**TASK # UU680:** Inflate tires.

**COMPETENCY:** Inflate tires with water, chemicals, and air following recommended procedures.

**CRITERION MEASURE:**

1. Tires are inflated to the recommended pounds of air or fluid pressure.
2. Tire pressure gauge is used and read correctly.

**TASK # UU681:** Inspect bearings and seals.

**COMPETENCY:**

1. Inspect seals for leakage prior to removing bearings and seals.
2. Remove bearings, wash in solvent, and determine amount of wear.

**CRITERION MEASURE:**

1. Seals are checked for leakage by observation.
2. Bearings are removed and percentage of wear determined.
3. Bearings are packed with grease and, if needed, new bearings installed according to correct procedures.

**TASK # UU682:** Inspect track pins and bushings.

**COMPETENCY:** Determine percentage of wear between track pins and bushings by observation and by using micrometer.

**CRITERION MEASURE:** Percentage of track pin and bushing wear is determined accurately by correctly using micrometer.

**TASK # UU683:** Load tires with liquid.

**COMPETENCY:** Load tires with liquid by attaching a pressure hose that supplies liquid through a special liquid valve.

**CRITERION MEASURE:**

1. Tires are properly loaded with liquid following recommended procedures.
2. Tires are inflated with liquid to the specified level or amount.

SUBJECT AREA: Repairing and Maintaining Wheels, Tires, and Tracks

TASK # UU684: Patch tubes.

COMPETENCY: Remove tube from tire, locate place of leakage, prepare the damaged area and glue patch to tube.

CRITERION MEASURE:

1. Tube is removed from tire without damaging tube or tire.
2. Place of leakage is located using suggested methods.
3. Damaged area is prepared following recommended procedures.
4. Correct size patch is selected and securely glued to tube.
5. Air and/or liquid is placed in tube and tube does not leak.

TASK # UU685: Remove and install track.

COMPETENCY:

1. Slacken adjustment tension of track, burn braded pin and drive pin out, pick up dozer with crane and remove track with crane.
2. Place track on sprockets, replace pin and bushing and adjust track tension.

CRITERION MEASURE:

1. Adjustment tension of track is loosened to specified amount.
2. End of pin is burned off and pin driven out.
3. Dozer is picked up by crane safely to specified height.
4. Track is placed on sprockets, pin and bushing installed, and track tension adjusted to manufacturer's recommendations.

TASK # UU686: Repack wheel bearings.

COMPETENCY: Repack wheel bearings by hand or by using wheel grease bearing packer.

CRITERION MEASURE: Wheel bearings are adequately packed with correct type of grease.

SUBJECT AREA: Repairing and Maintaining Wheels, Tires, and Tracks

TASK # UU687: Replace wheel bearings and seals.

COMPETENCY: Remove and install wheel bearings and seals on front and back axles following recommended procedures.

CRITERION MEASURE:

1. Old wheel bearings and seals are correctly removed without damaging axle.
2. New bearings and seals are installed following recommended procedures.
3. After installation, the seals do not leak, the bearings do not overheat, and the front wheels spin freely without heat buildup.

SUBJECT AREA: Repairing and Maintaining the Steering System

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| TASK # VV688: | Adjust steering gear bearings. |
| COMPETENCY: | Adjust steering bearing to remove the excessive motion in the steering wheel. |
| CRITERION MEASURE: | Excess amount of play is removed from steering wheel. |

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| TASK # VV689: | Adjust toe-in, drag link, and turning angle. |
| COMPETENCY: | Align vehicle by adjusting toe-in, drag link, and turning angle. |
| CRITERION MEASURE: | 1. Toe-in is adjusted to one-half inch out from center.<br>2. Drag link is adjusted for vertical uprightness of the front wheels.<br>3. Vehicle steers easily and does not bounce or dodge. |

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| TASK # VV690: | Bleed power steering system. |
| COMPETENCY: | Remove air from system by removing air and fluid under pressure. |
| CRITERION MEASURE: | Solid fluid is bled from the bleeder valve. |

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| TASK # VV691: | Inspect power steering motor assembly. |
| COMPETENCY: | Open pressure line and check fluid pressure by gauge to determine pump operation. |
| CRITERION MEASURE: | Fluid pressure is checked by reading PSI on gauge. |

SUBJECT AREA: Repairing and Maintaining the Steering System

**TASK # VV692:** Inspect power steering system for leaks.

**COMPETENCY:** Observe power steering system for leaks.

**CRITERION MEASURE:** Fluid is not found outside power steering system

**TASK # VV693:** Inspect power steering valve assembly.

**COMPETENCY:** Remove valve assembly and inspect valves and valve seats.

**CRITERION MEASURE:** Valve is determined to be seating or not seating properly.

**TASK # VV694:** Inspect steering gears.

**COMPETENCY:** Remove cover from housing, remove and clean gears, and inspect gears by determining amount of wear by using micrometer.

**CRITERION MEASURE:** Amount of wear of steering gears is determined correctly by reading micrometer.

**TASK # VV695:** Install and adjust power steering pump belt tension.

**COMPETENCY:** Determine pulleys on which to install belt and adjust belt tensions.

**CRITERION MEASURE:**
1. Belt is installed on correct pulleys.
2. Belt is adjusted to specified tension.

**TASK # VV696:** Remove and install ball joints.

**COMPETENCY:** Remove lock bolt, drive out ball joint and replace ball joint.

**CRITERION MEASURE:** Ball joint is removed and installed by following specified procedures.

SUBJECT AREA: Repairing and Maintaining the Steering System

TASK # VV697: Remove and install power steering pump.

COMPETENCY:
1. Remove belts from braces, remove pressure lines, and lift out pump.
2. Put pump in correct location and attach pressure lines and mounting assembly.

CRITERION MEASURE:
1. Power steering pump is removed efficiently and without damage.
2. Power steering pump is installed correctly following recommended procedures.

TASK # VV698: Repair power steering valve assembly.

COMPETENCY: Remove valve assembly head and replace valves and valve seats.

CRITERION MEASURE:
1. Valve assembly head is removed without damage.
2. Valves seat properly.

TASK # VV699: Remove and install power steering valve assembly.

COMPETENCY: Disassemble the housing, remove valves, and install new valves.

CRITERION MEASURE:
1. O-rings, valves, and valve seats are installed correctly.
2. Hydraulic system operates properly.

## SUBJECT AREA: Repairing and Maintaining the Steering System

**TASK # VV700:** Remove and install tie rods.

**COMPETENCY:** Remove tie rod ends and install new tie rods.

**CRITERION MEASURE:** Tie rods are installed following established procedures.

**TASK # VV701:** Repair power steering motor.

**COMPETENCY:** Disassemble power steering motor and replace the pump.

**CRITERION MEASURE:** The power steering motor generates the PSI specifications of the manufacturer.

**TASK #VV702:** Replace steering gears and knuckles.

**COMPETENCY:** Disassemble steering sector and replace worn gear and guide.

**CRITERION MEASURE:**

1. Correct assembly procedures are followed.
2. Excessive steering motion is eliminated.

SUBJECT AREA: Repairing and Maintaining the Hydraulic System

TASK # WW703: Add hydraulic oil to system.

COMPETENCY: Check hydraulic oil level and add oil to full mark on dip stick.

CRITERION MEASURE:
1. Oil level on dip stick is read accurately.
2. Appropriate hydraulic oil is added until full mark on dip stick is reached.

TASK # WW704: Bleed hydraulic system or remove cylinder.

COMPETENCY: Open connections under pressure to remove air.

CRITERION MEASURE: All air is removed from system and system performs.

TASK # WW705: Determine purpose of hydraulic system parts.

COMPETENCY: Identify system parts and state the purpose of each part.

CRITERION MEASURE: Hydraulic system parts are correctly identified.
Purpose of each part is accurately provided.

TASK # WW706: Diagnose pump failures.

COMPETENCY: Identify the cause of hydraulic pump failures.

CRITERION MEASURE: Pump failures are correctly identified.

## SUBJECT AREA: Repairing and Maintaining the Hydraulic System

**TASK # WW707:** Drain, clean, flush, and refill hydraulic system.

**COMPETENCY:**

1. Open system and drain hydraulic fluid.
2. Disassemble system and place parts in cleaning solution.
3. Assemble system and flush with appropriate solution.
4. Fill system with proper hydraulic fluid.

**CRITERION MEASURE:**

1. All fluid is properly removed from system.
2. Burned fluid and foreign particles are removed during cleaning and flushing.
3. Manufacturer's recommended hydraulic fluid is added to the system to the proper level.

**TASK # WW708:** Evaluate influence contaminants have on operation of hydraulic system.

**COMPETENCY:** Identify the influence of contaminants on the operation of hydraulic systems.

**CRITERION MEASURE:** The malfunction of the system caused by contaminants is correctly identified.

**TASK # WW709:** Identify parts of hydraulic systems.

**COMPETENCY:** Identify parts of specified hydraulic systems by visual inspection.

**CRITERION MEASURE:** Hydraulic system parts are correctly identified.

**TASK # WW710:** Identify types of hydraulic pumps.

**COMPETENCY:** Identify types of hydraulic pumps by manufacturer and serial number.

**CRITERION MEASURE:** Types of hydraulic pumps are correctly identified.

SUBJECT AREA: Repairing and Maintaining the Hydraulic System

**TASK # WW711:** Identify types of hydraulic systems.

**COMPETENCY:** Identify types of hydraulic systems by manufacturer and serial number.

**CRITERION MEASURE:** Types of hydraulic systems are correctly identified.

**TASK # WW712:** Inspect and clean oil cooler.

**COMPETENCY:** Determine proper performance of oil cooler by periodic inspection and clean as needed by draining cooler and flushing with appropriate solution.

**CRITERION MEASURE:**

1. Oil cooler is inspected following recommendations of manufacturer.
2. Oil cooler is properly drained and flushed following recommended procedures.

**TASK # WW713:** Inspect components of pumps and motors.

**COMPETENCY:** Determine wear of pumps and check for foreign matter and cooling capacity of motors.

**CRITERION MEASURE:**

1. The type and amount of wear in pumps is identified correctly.
2. Reduced air circulation and reduction in rpm's of motors are diagnosed.

**TASK # WW714:** Inspect hydraulic valves and valve springs.

**COMPETENCY:** Determine valve sectage and valve spring tension.

**CRITERION MEASURE:** Lack of performance of valves is identified.

SUBJECT AREA: Repairing and Maintaining the Hydraulic System

TASK # WW715: Install O-rings, seals, and packing.

COMPETENCY: Remove O-rings, seals, and packings and replace using recommended procedures.

CRITERION MEASURE: Contaminant of fluid in the hydraulic system and contaminant of fluid within the correct compartment of the system is maintained.

TASK # WW716: Locate internal and external leakage problems.

COMPETENCY: Determine the loss of hydraulic fluid visually and by operation of equipment.

CRITERION MEASURE: Leakage of fluid is identified and problems diagnosed.

TASK # WW717: Measure pump and motor tolerances.

COMPETENCY: Determine pump tolerance by using pressure gauge.

CRITERION MEASURE: Tolerance is correctly determined by using the pressure gauge within the line.

TASK # WW718: Read schematic of hydraulic systems.

COMPETENCY: Read and interpret schematic of hydraulic systems.

CRITERION MEASURE: Practical applications by the use of schematics is applied to live hydraulic systems.

SUBJECT AREA: Repairing and Maintaining the Hydraulic System

**TASK # WW719:** Remove and install hydraulic hoses or tubing.

**COMPETENCY:** Disassemble faulty hydraulic hoses and tubing and install new hoses and tubing.

**CRITERION MEASURE:**

1. Hydraulic hoses and tubing are removed following recommended procedures.
2. New hoses and tubing are installed correctly and leaks do not occur during operation of equipment.

**TASK # WW720:** Remove and install hydraulic pumps.

**COMPETENCY:** Disconnect hydraulic hoses, mounts, and drive belt, remove pump, and reverse the procedure for installation of pump.

**CRITERION MEASURE:**

1. Hydraulic pump is removed without damaging hoses, mounts, or drive belt.
2. Hydraulic pump is installed properly with proper connections made.
3. Pump or hoses do not leak during operation of equipment.

**TASK # WW721:** Remove and install hydraulic oil cooler.

**COMPETENCY:** Remove hoses, mounts, and cooling mechanism and reverse the procedure for installation.

**CRITERION MEASURE:**

1. Hydraulic oil cooler is removed without damaging hoses or mounts.
2. Hydraulic oil cooler is installed using appropriate procedures.
3. Cooler or hoses do not leak during operation of equipment.

SUBJECT AREA: Repairing and Maintaining the Hydraulic System

**TASK # WW722:** Remove and install hydraulic relief valves, check valves, bypass valves, and control valves.

**COMPETENCY:**

1. Disconnect hydraulic lines and remove relief valves, check valves, and bypass valves and replace with new valves in the lines.
2. Disassemble all lines and mountings from control valves, remove valves, and reverse the procedure for installation of control valves.

**CRITERION MEASURE:**

1. Valves are removed without damaging lines.
2. Valves are installed using appropriate procedures.
3. Valves or hoses do not leak during operation of equipment.

**TASK # WW723:** Replace and adjust components of hydraulic valves.

**COMPETENCY:** Remove hydraulic valve components from valve assembly, replace new components and adjust components within specified tolerance.

**CRITERION MEASURE:**

1. Hydraulic valve components are removed without damaging valve assembly.
2. Valve components are installed to assembly and adjusted to specified tolerance.

**TASK # WW724:** Replace and adjust pump wear plates.

**COMPETENCY:** Remove wear plates from pump, replace, and adjust to specified tolerance.

**CRITERION MEASURE:**

1. Wear plates are removed without damaging pump.
2. Wear plates are installed and adjusted to specified tolerance.

SUBJECT AREA: Repairing and Maintaining the Hydraulic System

**TASK # WW725:** Replace cylinder barrels and cylinder rods.

**COMPETENCY:** Disassemble the hydraulic cylinder housing, remove the barrel, piston, and rod, and replace barrel, piston, and rod.

**CRITERION MEASURE:**

1. Cylinder barrel, piston, and rod are removed and replaced according to manufacturer's recommendations.
2. After installation of the barrel, piston, and rods, the hydraulic cylinder is in proper operating condition.

**TASK # WW726:** Replace hydraulic oil filters.

**COMPETENCY:** Remove cartridge from oil filter container and install new filter.

**CRITERION MEASURE:**

1. Oil filter is removed without damaging mechanism.
2. New oil filter does not leak.

**TASK # WW727:** Test valve cartridges for pressure setting.

**COMPETENCY:** Adjust setting on cartridge to test for proper pressure.

**CRITERION MEASURE:** In-line pressure gauge is used and read correctly to determine proper setting.

SUBJECT AREA: Repairing and Maintaining the Ignition, Charging, and Starting System

TASK # XX728: Adjust regulator air gap.

COMPETENCY: Remove top of regulator and adjust air gap for intervals of charging and discharging by using ammeter and voltmeter.

CRITERION MEASURE:

1. The ammeter and voltmeter are connected correctly.
2. The ammeter and voltmeter readings are adjusted to manufacturer's specifications.

TASK # XX729: Check for spark.

COMPETENCY: Check for spark at the coil, points, and spark plug gap visually or by using voltmeter.

CRITERION MEASURE: Spark is correctly determined by identification of inability of electrical part to perform.

TASK # XX730: Check ignition resistor with ohmmeter.

COMPETENCY: Check ignition resistor with ohmmeter to determine if the resistor is defective.

CRITERION MEASURE:

1. The ohmmeter is connected to the proper terminals.
2. The ohmmeter is read correctly and the reading is properly interpreted.

TASK # XX731: Check specific gravity of battery.

COMPETENCY: Check specific gravity of battery by using the hydrometer.

CRITERION MEASURE:

1. The hydrometer is held vertically to extract battery fluid.
2. Proper amount of battery fluid is extracted in the hydrometer.
3. The reading is taken at eye level and is interpreted correctly.

SUBJECT AREA: Repairing and Maintaining the Ignition, Charging, and Starting System

TASK # XX732: Check timing.

COMPETENCY:

1. Check engine timing by using a timing light and engine analyzer following specified procedures.
2. Set the timing according to manufacturer's specifications.

CRITERION MEASURE:

1. The timing light and engine analyzer are connected correctly.
2. Results of using the timing light and engine analyzer are interpreted correctly.
3. The timing is set correctly following manufacturer's specifications and following recommended procedures.

TASK # XX733: Clean and inspect distributor cap, rotor, and housing cover.

COMPETENCY:

1. Clean distributor cap, rotor, and housing cover by using cloth, cleaning fluid, and air.
2. Inspect distributor cap, rotor, and housing cover for cracks, wear, and foreign matter.

CRITERION MEASURE:

1. The distributor cap, rotor, and housing cover are cleaned of all foreign matter.
2. Cracks, foreign matter, and the amount of wear are determined by proper inspection of the distributor cap, rotor, and housing cover.

TASK # XX734: Clean regulator contact points.

COMPETENCY: Clean regulator contact points by using a file or sandpaper.

CRITERION MEASURE:

1. The proper type of file and sandpaper is used to clean regulator contact points.
2. The regulator contact points are properly cleaned.

SUBJECT AREA: Repairing and Maintaining the Ignition, Charging, and Starting System

**TASK # XX735:** Clean starter drives.

**COMPETENCY:** Clean starter drives using cleaning fluids to remove foreign matter.

**CRITERION MEASURE:** Starter drive is clean of foreign matter and operative.

**TASK # XX736:** Conduct generator output test for amperage, voltage, and resistance.

**COMPETENCY:** Connect voltmeter to proper terminals, increase rpm's, and read and interpret the voltmeter to determine amperage, voltage, and resistance.

**CRITERION MEASURE:**

1. The voltmeter is properly connected to the appropriate terminals.
2. The voltmeter is read and interpreted correctly to determine amperage, voltage, and resistance.

**TASK # XX737:** Conduct regulator current test.

**COMPETENCY:** Conduct regulator current test for amperage by using ammeter.

**CRITERION MEASURE:**

1. The ammeter is connected to proper terminals.
2. The ammeter is read and properly interpreted to determine amperage.

**TASK # XX738:** Conduct regulator voltage test.

**COMPETENCY:** Conduct regulator voltage test to determine proper voltage by using voltmeter.

**CRITERION MEASURE:**

1. The voltmeter is connected to proper terminals.
2. The voltmeter is read and properly interpreted to determine voltage.

SUBJECT AREA: Repairing and Maintaining the Ignition, Charging, and Starting System

TASK # XX739: Determine purpose of parts in the system.

COMPETENCY: Specify the purpose(s) of the various components of the ignition, charging, and starting system.

CRITERION MEASURE: The purpose(s) of the various components of the ignition, charging, and starting system is correctly listed.

TASK # XX740: Identify parts of the system.

COMPETENCY: Visually identify the various parts of the ignition, charging, and starting system.

CRITERION MEASURE: Specified parts of the ignition, charging, and starting system are correctly identified.

TASK # XX741: Inspect breaker points.

COMPETENCY: Observe breaker points for pits, burns, and wear to determine possible replacement.

CRITERION MEASURE: Pits, burns, and wear are identified on breaker points. The correct decision is made to replace or not replace breaker points after inspection is completed.

TASK # XX742: Inspect components of distributor.

COMPETENCY: Visually inspect all components of the distributor to determine amount of wear.

CRITERION MEASURE: The amount of wear of the components of the distributor is correctly identified.

**TASK # XX743:** Inspect components of starter.

**COMPETENCY:** Visually inspect all components of the starter to determine amount of wear.

**CRITERION MEASURE:** The amount of wear of the components of the starter is correctly identified.

**TASK # XX744:** Inspect for poor electrical connections.

**COMPETENCY:** Visually inspect all wiring harness to determine loose electrical connections.

**CRITERION MEASURE:** All loose electrical connections are identified.

**TASK # XX745:** Inspect parts of generator.

**COMPETENCY:** Visually inspect all parts of the generator to determine amount of wear.

**CRITERION MEASURE:** The amount of wear of the parts of the generator is correctly identified.

**TASK # XX746:** Inspect the wiring harness for broken wires.

**COMPETENCY:** Visually observe all wires to determine faulty or broken wires.

**CRITERION MEASURE:** All faulty or broken wires are identified.

SUBJECT AREA: Repairing and Maintaining the Ignition, Charging, and Starting System

**TASK # XX747:** Inspect spark plugs.

**COMPETENCY:** Remove spark plugs and inspect for burned tips, spark gap, and electrical conductivity.

**CRITERION MEASURE:**

1. Spark plugs are removed without damage.
2. Burned tips on plugs are identified.
3. Spark gap is correctly determined, checked against manufacturer's specifications, and set to specifications if necessary.
4. The electrical conductivity of spark plugs is determined.

**TASK # XX748:** Inspect switches.

**COMPETENCY:** Inspect switches for loose connections and wear.

**CRITERION MEASURE:** Loose connections and wear on switches are correctly identified.

**TASK # XX749:** Install and adjust breaker points.

**COMPETENCY:** Remove breaker points, replace, and adjust to manufacturer's specifications.

**CRITERION MEASURE:**

1. Breaker points are removed and replaced according to recommended procedures.
2. Breaker points are adjusted with the use of a feeler gauge to manufacturer's specifications.

SUBJECT AREA: Repairing and Maintaining the Ignition, Charging, and Starting System

TASK # XX750: Install and adjust generator belts.

COMPETENCY: Remove worn belts, replace with new belts, and adjust belts for proper tension.

CRITERION MEASURE:

1. Worn belts are removed following recommended procedures.
2. New belts are selected that are the correct length and width.
3. New belts are installed following recommended procedures and adjusted to one inch vertical play.

TASK # XX751: Install and adjust spark plugs.

COMPETENCY: Remove defective spark plugs, adjust gap on new plugs according to manufacturer's specifications, and install plugs following recommended procedures.

CRITERION MEASURE:

1. Defective spark plugs are removed using proper tools without breaking the plugs.
2. Gap on new plugs are adjusted to manufacturer's recommendations.
3. New plugs are installed without cross-threading or damaging the plugs.
4. Spark plug wires are reconnected to the proper cylinders.

TASK # XX752: Install and service battery.

COMPETENCY:

1. Choose a proper ampheres battery.
2. Place battery in holder.
3. Connect positive and negative.
4. Fill to proper level with water.
5. Charge for short period of time if recommended by manufacturer.

CRITERION MEASURE:

1. Correct ampheres battery is chosen based on manufacturer's recommendations.
2. Positive and negative cables are connected to the correct poles.
3. Water is added to battery cells to indicated level.
4. Battery charger is connected to the proper battery poles and operated correctly for a specified time.

TASK # XX753: Make no load test on starter.

COMPETENCY: Determine the amphere-draw needed to crank engine and compare test findings with manufacturer's specifications.

CRITERION MEASURE:
1. Manufacturer's specifications on ampherage needed to crank engine is interpreted correctly.
2. Test used to determine actual ampherage needed to crank engine is completed following recommended procedures.
3. Manufacturer's specifications on ampherage needed to crank engine are compared with actual test and correct interpretations are made.

TASK # XX754: Polarize the generator.

COMPETENCY:
1. Connect a jumper wire to the battery terminal of the voltage regulator.
2. Strike or momentarily touch wire to the armature terminal of the regulator.
3. Disconnect the jumper lead.

CRITERION MEASURE:
1. The jumper wire is securely connected to the battery terminal of the voltage regulator.
2. The wire is correctly touched to the armature terminal of the regulator.
3. The generator produces an electrical charge.

TASK # XX755: Read electrical schematic drawings.

COMPETENCY: Trace electrical wiring of engine from each electrical part.

CRITERION MEASURE: Specified electrical schematic drawings are read correctly.

SUBJECT AREA: Repairing and Maintaining the Ignition, Charging, and Starting System

**TASK # XX756:** Rebuild distributor or replace distributor parts.

**COMPETENCY:** Remove distributor parts and install new parts - distributor cap, rotor button, points, condenser, distributor shaft, any timing gear.

**CRITERION MEASURE:**

1. Worn or defective distributor parts are removed in the proper order following recommended procedures.
2. Distributor parts are installed in the proper order following recommended procedures.

**TASK # XX757:** Remove and install distributor.

**COMPETENCY:**

1. Remove wires from terminals.
2. Locate and loosen the distributor lock and lift distributor and shaft from engine.
3. Locate oil shaft, slide distributor shaft onto oil shaft, manually turn rotor button to number 1 terminal, and push distributor into cavity in engine.
4. Convert wires to the terminals in the proper firing order that is stamped on the intake manifold.

**CRITERION MEASURE:**

1. Distributor is removed from the engine without damage following recommended procedures.
2. Distributor is installed correctly following recommended procedures.
3. Wires are connected to the terminals in the proper firing order.

**TASK # XX758:** Remove and install generator.

**COMPETENCY:** Disconnect wire terminals, loosen bracket bolts, remove v-belt, and remove generator. To replace generator, reverse the above procedure.

**CRITERION MEASURE:** Generator is removed and installed following recommended procedures.

SUBJECT AREA: Repairing and Maintaining the Ignition, Charging, and Starting System

TASK # XX759: Remove and install voltage regulator.

COMPETENCY: Disconnect wire terminals, remove the screws, and remove voltage regulator. To install voltage regulator, reverse the procedure.

CRITERION MEASURE: Voltage regulator is removed and installed following recommended procedures.

TASK # XX760: Remove and install solenoid.

COMPETENCY: Disconnect battery and starter cable from solenoid switch, remove the hex-headed screws from the base, and remove solenoid. To install solenoid, reverse the process.

CRITERION MEASURE: Remove and install solenoid following recommended procedures.

TASK # XX761: Remove and install starter.

COMPETENCY: Disconnect the solenoid cable by use of proper wrenches, remove the foundation bolts, slide starter bendix out of flywheel, and remove starter from flywheel housing. To install starter, reverse the process.

CRITERION MEASURE:

1. Solenoid cable is disconnected and reconnected using proper wrenches and following recommended procedures.
2. Foundation bolts are removed and replaced correctly.
3. Bendix is removed from flywheel and replaced properly.
4. Starter is removed from flywheel housing and replaced properly.
5. Terminal wires are not twisted or broken.

SUBJECT AREA: Repairing and Maintaining the Ignition, Charging, and Starting System

**TASK # XX762:** Replace generator bearings.

**COMPETENCY:** Remove generator rods, remove brushes and caps, remove housing from the armature, remove the pulley using a press or puller, remove front cap and bearing, replace bearings in caps, and reassemble generator.

**CRITERION MEASURE:**

1. Generator is disassembled correctly using proper tools, bearings replaced, and generator reassembled properly.
2. Performance of generator after assembly meets manufacturer's specifications.

**TASK # XX763:** Replace generator brushes and springs.

**COMPETENCY:** Remove set screw on brush wire and spring, slide brushes out of holder, replace brushes, and connect brush wire and spring with set screw.

**CRITERION MEASURE:** Generator brushes and springs are removed and replaced following recommended procedures.

**TASK # XX764:** Replace spark plug wires.

**COMPETENCY:** Remove and replace individual spark plug wires, beginning with the number 1 cylinder wire and continuing consecutively.

**CRITERION MEASURE:** Spark plug wires are replaced according to the correct firing order.

**TASK # XX765:** Replace starter brushes.

**COMPETENCY:** Remove set screw on brush wire and spring, slide brushes out of holder, replace brushes, and connect brush wire and spring with set screw.

**CRITERION MEASURE:** Generator brushes and springs are removed and replaced following recommended procedures.

TASK # XX766: Replace starter bushing.

COMPETENCY: Remove starter rods, remove brushes and caps, remove housing from the armature, remove the pulley using a profess or puller, remove front caps and bushing, replace bushing in caps, and reassemble starter.

CRITERION MEASURE:

1. Starter is disassembled correctly using proper tools, bushings replaced, and starter reassembled properly.
2. Performance of starter after assembly meets manufacturer's specifications.

TASK # XX767: Take voltage drop test.

COMPETENCY:

1. Connect one lead terminal of voltage meter to battery side of alternator.
2. Connect one lead terminal of voltage meter to the grounded side of the circuit to check for a voltage drop of less than .1 volts.

CRITERION MEASURE:

1. Lead terminals of voltage meter are properly connected to the alternator and to the grounded side of the circuit.
2. Voltage meter is read and interpreted correctly to determine amount of voltage drop.

TASK # XX768: Test coil polarity.

COMPETENCY:

1. Connect the terminals of the voltmeter to primary and secondary terminals of the coil.
2. Strike the ground terminal of the battery to the secondary terminal of the coil.
3. Read and interpret the voltmeter reading.

CRITERION MEASURE:

1. All terminals of the voltmeter are correctly connected.
2. The ground terminal of the battery is properly touched with the secondary terminal of the coil.
3. The voltmeter is correctly read and interpreted.

SUBJECT AREA: Repairing and Maintaining the Ignition, Charging, and Starting System

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| TASK # XX769: | Test coil when cold and hot. |
| COMPETENCY: | 1. Connect voltmeter terminals to primary and secondary terminals of coil.<br>2. Check the coil amperage when the coil is at minimum temperature and at normal operating temperature.<br>3. Compare the amperage readings to determine any voltage drop. |
| CRITERION MEASURE: | 1. Voltmeter is correctly connected to the coil.<br>2. The voltmeter is read and interpreted for a cold and a hot coil.<br>3. Correct diagnosis of coil operation is made. |

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| TASK # XX770: | Test condensor for resistance, leakage, and capacity. |
| COMPETENCY: | Ground the condensor, touch the negative wire of the condensor to a power source, and test the condensor to determine charge. |
| CRITERION MEASURE: | 1. The condensor is correctly grounded.<br>2. The negative wire of the condensor is properly connected to a battery or power source.<br>3. The condensor is correctly tested to determine resistance, capacity, and leakage. |

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| TASK # XX771: | Test distributor with distributor tester. |
| COMPETENCY: | Test distributor for amperage during operation with a tester following recommended procedures. |
| CRITERION MEASURE: | The distributor amperage is correctly determined and correct analysis is made of its proper operation. |

TASK # XX772: Test generator armature for open circuit, ground, or short circuit in windings.

COMPETENCY: Connect ohms meter to complete circuit, ground circuit, and to short circuit in the windings. Test to determine voltage drop or resistance.

CRITERION MEASURE:

1. Ohms meter is connected to the proper terminals.
2. Circuit is completed without a short in the armature.
3. Leakage does not occur from the windings.
4. Ohms meter is read and interpreted correctly.

TASK # XX773: Test generator field coils for grounds or open circuits.

COMPETENCY: Connect ohms meter to complete circuit, ground circuit, and to short circuit in the windings. Test to determine voltage drop or resistance.

CRITERION MEASURE:

1. Ohms meter is connected to the proper terminals.
2. Circuit is completed without a short in the field coil windings.
3. Leakage does not occur from the windings.
4. Ohms meter is read and interpreted correctly.

TASK # XX774: Test ignition system for open circuits, grounds, and resistance with voltmeter.

COMPETENCY: Connect voltmeter to energized terminals of ignition system and check for open circuits, grounds, and resistance.

CRITERION MEASURE:

1. Voltmeter is connected to the correct terminals of ignition system.
2. Voltmeter readings are correctly compared with the original voltage.

SUBJECT AREA: Repairing and Maintaining the Ignition, Charging, and Starting System

TASK # XX775: Test solenoid for resistance and voltage draw.

COMPETENCY: Connect voltmeter to energized terminals of solenoid and check for resistance.

CRITERION MEASURE:
1. Voltmeter is connected to the correct terminals of solenoid.
2. Voltmeter readings are correctly compared with the original voltage.

TASK # XX776: Test solenoid switch circuit.

COMPETENCY:
1. Connect voltmeter to solenoid terminals and check for resistance.
2. Energized solenoid switch and check with voltmeter for voltage draw.

CRITERION MEASURE:
1. Voltmeter is properly connected to solenoid terminals.
2. Solenoid switch is correctly energized.
3. Voltmeter readings are read and properly interpreted.

TASK # XX777: Test starter armature and field coils.

COMPETENCY:
1. Connect voltmeter to field coil terminals and check for resistance.
2. Inspect the armature for wear and determine if it needs turning.

CRITERION MEASURE:
1. Voltmeter is connected correctly to the field coil terminals.
2. Voltmeter readings are read and properly interpreted.
3. Starter armature is visually inspected for wear and correct determination made for machining, replacement, or no repair needed.

**TASK # XX778:** Test for oxidized regulator points.

**COMPETENCY:** Connect voltmeter to regulator point terminals and check for resistance.

**CRITERION MEASURE:**

1. Voltmeter is converted to the proper terminals.
2. Voltmeter readings are read and properly interpreted.

**TASK # XX779:** Time ignition system to engine.

**COMPETENCY:** Wire engine to the proper stroke according to manufacturer's firing order.

**CRITERION MEASURE:**

1. Firing order is located on intake manifold and correctly read and interpreted.
2. Wires from the distributor to the proper cylinders are connected correctly.
3. Each cylinder of engine fires on the proper stroke.

**TASK # XX780:** Unlock starter.

**COMPETENCY:**

1. Remove inspection plate from flywheel cover, place screwdriver in ring gear, and turn the engine.
2. Remove the starter and replace it.

**CRITERION MEASURE:**

1. Inspection plate is correctly removed from flywheel cover.
2. Screwdriver is correctly placed in ring gear and ring gear turned.
3. Starter is removed and replaced according to recommended procedures.
4. Engine will turn freely.

SUBJECT AREA: Repairing and Maintaining the Ignition, Charging, and Starting System

**TASK # XX781:** Use voltmeter to check battery voltage.

**COMPETENCY:** Connect voltmeter to negative battery terminal and insert voltmeter terminal in each battery cell. Read voltmeter to determine voltage.

**CRITERION MEASURE:**

1. Voltmeter is connected correctly to negative battery terminal and voltmeter terminal is inserted in battery terminals.
2. Voltmeter is correctly read and interpreted.

**TASK # XX782:** Wire the ignition, charging, and starting circuits.

**COMPETENCY:** Connect the wiring harness to the correct terminals of the ignition, charging, and starting circuits.

**CRITERION MEASURE:**

1. Wiring harness is correctly connected to the proper terminals of the ignition, charging, and starting circuits according to the schematic of the manufacturer.
2. Ignition, charging, and starting circuits function properly.

**TASK # XX783:** Replace field windings in starter.

**COMPETENCY:** Disassemble starter, detach field windings from inside of starter housing, replace field windings, and reassemble starter.

**CRITERION MEASURE:**

1. Starter is correctly disassembled.
2. Field windings are removed and new windings are correctly installed.
3. Starter is properly reassembled.

SUBJECT AREA: Repairing and Maintaining the Ignition, Charging, and Starting System

| | |
|---|---|
| TASK # XX784: | Replace ignition switches. |
| COMPETENCY: | Remove or unplug wires from ignition switch, remove lock nut, slide switch forward, and replace switch by reversing the procedure. |
| CRITERION MEASURE: | 1. Wires are removed or unplugged from ignition switch.<br>2. Lock nut is located and properly removed.<br>3. Ignition switch is removed and new switch is inserted correctly.<br>4. Wires are reconnected properly.<br>5. The ignition energizes the system. |

SUBJECT AREA: Repairing and Maintaining Electrical Accessories

**TASK # YY785:** Adjust headlights.

**COMPETENCY:** Adjust headlights using proper tools and following recommended procedures.

**CRITERION MEASURE:**

1. Headlight aiming device is attached correctly to the sealed beam bulb.
2. Instruments readings are interpreted correctly.
3. Appropriate screws are turned on each bulb holder to adjust lights vertically and horizontally according to aiming tool readings.
4. All safety precautions are observed to avoid any broken bulbs and other hazards.

**TASK # YY786:** Install wiring harness.

**COMPETENCY:** Install wiring harness using correct tools and following recommended procedures.

**CRITERION MEASURE:**

1. Old wiring harness is removed correctly.
2. Color codes of wire are followed and new harness is installed properly.
3. All wires to terminals are tightened being sure to remove any point for good contact.
4. Each electrical circuit is operated and tested for proper installation of the harness.
5. All safety procedures are followed when installing the wiring harness.

SUBJECT AREA: Repairing and Maintaining Electrical Accessories

TASK # YY787: Repair broken electrical wires.

COMPETENCY: Correctly repair broken electrical wires and test wires for for safe use.

CRITERION MEASURE:

1. Sources of wire failure or breakage are determined.
2. Insulation is properly removed from both ends of the break, one to one and a half inches back.
3. The ends of the naked wire are tied in a loop and excess wire is wrapped securely around each side of the tie. until all of it is used up.
4. The spliced naked wires are wrapped securely with electrical insulating tape.
5. Electrical circuit is tested to insure the splice repair works properly.
6. All safety rules and procedures are followed.

TASK # YY788: Replace circuit breakers.

COMPETENCY: Properly remove and replace circuit breakers.

CRITERION MEASURE:

1. All wires from the breaker terminals are disconnected noting the position of each connection.
2. Screws, bolts, or clamps are loosened and removed, and the circuit breaker is removed.
3. The new circuit breaker is correctly positioned and fastened.
4. All wires are connected to their proper terminals for correct operation.
5. All safety rules are observed for installing circuit breakers.

SUBJECT AREA: Repairing and Maintaining Electrical Accessories

**TASK # YY789:** Replace fuses.

**COMPETENCY:** Properly install fuses in circuits.

**CRITERION MEASURE:**

1. Damaged fuses to be replaced are located and removed by carefully lifting them from the terminals.
2. Correct replacement fuses are selected.
3. Terminal contacts are properly cleaned and fuses are properly inserted in circuits.
4. The electrical circuit is properly tested.
5. All safety practices are followed.

**TASK # YY790:** Replace fuse blocks.

**COMPETENCY:** Correctly remove and replace fuse holding blocks following recommended procedures.

**CRITERION MEASURE:**

1. The wires to the blocks are properly disconnected, noting the correct position of each wire.
2. The screws, bolts, or clamps holding the block in place are removed.
3. The replacement block is positioned and secured in place by reclamping and tightening the screws.
4. All the wires to the block are reconnected, each to its correct terminal.
5. The electrical circuit is properly tested.
6. All safety precautions are observed.

**TASK # YY791:** Replace gauges.

**COMPETENCY:** Replace and install gauges following recommended procedures.

**CRITERION MEASURE:**

1. All wires, cables, and clamps are properly removed that hold the gauge in place.
2. The gauge is removed and a new one selected that is correct.
3. The new gauge is installed, properly replacing the wires, cables, and clamps correctly.
4. The gauge is checked for proper operation.
5. All safety practices are followed for gauge removal and installation.

SUBJECT AREA: Repairing and Maintaining Electrical Accessories

TASK # YY792: Replace lenses.

COMPETENCY: Remove and replace broken or defective lenses.

CRITERION MEASURE:

1. Holding screws, gaskets, and lenses are removed using correct tools.
2. Lenses of the right kind and color are selected.
3. Sealing gaskets, lenses, and lense holders are properly installed.
4. Safety rules and precautions are followed.

TASK # YY793: Replace light bulbs.

COMPETENCY: Properly remove and replace light bulbs.

CRITERION MEASURE:

1. The screws, lense cover, and bulb are carefully removed.
2. A bulb is selected that is the same size and type as the bulb removed.
3. The new bulb is installed properly without damaging the terminal or the bulb.
4. The circuit is activated and the bulb burns and otherwise works correctly.
5. All safety rules and regulations are observed.

TASK # YY794: Replace speedometer cable and housing.

COMPETENCY: Remove and install a speedometer cable and housing using proper tools and following recommended procedures.

CRITERION MEASURE:

1. The housing ring is properly unscrewed from the transmission or driveshaft housing and from the speedometer.
2. The speedometer cable is removed from the fitted receptacle on the speedometer and transmission and from the cable housing.
3. A new speedometer cable is selected that is correct.
4. The new cable and housing are installed properly.
5. All safety precautions are observed.

SUBJECT AREA: Repairing and Maintaining Electrical Accessories

TASK # YY795: Replace switches.

COMPETENCY: Remove and replace electrical control vehicle switches following recommended procedures.

CRITERION MEASURE:

1. The switch wires are disconnected from the proper terminal connections.
2. The switch is removed by the appropriate means, whether snapped in, screwed, bolted, etc.
3. A replacement switch is selected by noting the numbers, type, etc.
4. The new switch is installed following recommended procedures.
5. After installation, the switch functions properly.
6. All safety regulations concerning electrical circuits are followed.

TASK # YY796: Replace warning devices.

COMPETENCY: Remove and replace all warning devices such as gauges, lights, and sound devices.

CRITERION MEASURE:

1. All wires, cables, and connections are correctly removed from the device.
2. Replacement devices are selected that meet manufacturer's recommendations.
3. New devices are installed following recommended procedures.
4. After installation, the devices function properly.
5. All safety regulations are followed relating to the devices and electrical circuits.

SUBJECT AREA: Repairing and Maintaining Electrical Accessories

**TASK # YY797:** Test circuits for shorts, grounds, and open circuits.

**COMPETENCY:** Use appropriate meters for testing circuits for shorts, opens, and grounds and remedies any such malfunction.

**CRITERION MEASURE:**

1. All circuits are first correctly checked for loose wires, corroded grounds and other possible shorts.
2. Appropriate testers are used to test various circuits.
3. Circuit testers are attached correctly and they are read and interpreted correctly.
4. Malfunctioning circuits are corrected and retested correctly.
5. All safety regulations are followed when testing and repairing electrical circuits.

**TASK # YY798:** Test operation of gauges.

**COMPETENCY:** Use appropriate equipment to test the proper operation of gauges and repair or replace malfunctioning gauges.

**CRITERION MEASURE:**

1. Appropriate test equipment is selected to check the proper operation of selected gauges.
2. Testers are correctly attached to test the gauges.
3. Testers are correctly read and interpreted.
4. Malfunctioning gauges are identified, the malfunction correctly diagnosed, and the gauge repaired or correctly replaced.
5. All safety regulations are followed.

**TASK # YY799:** Test solenoids.

**COMPETENCY:** Use voltmeter to test solenoids for shorts.

**CRITERION MEASURE:**

1. Voltmeter is correctly attached to terminals.
2. Voltmeter is correctly read to determine if electricity is passing through the circuits.

SUBJECT AREA: Overhauling and Maintaining Engines

**TASK # ZZ800:** Adjust valve clearance

**COMPETENCY:** Determine clearance between the valve stem and the push rod by using a feeler gauge and set the clearance according to manufacturer's recommendations.

**CRITERION MEASURE:**

1. Feeler gauge is correctly used to determine valve clearance.
2. Valve clearance is adjusted to meet manufacturer's recommendations.

**TASK # ZZ801:** Check compression.

**COMPETENCY:** Use cylinder compression gauge to determine the compression for each cylinder.

**CRITERION MEASURE:**

1. The cylinder compression gauge is properly inserted into each cylinder spark plug opening.
2. The cylinder compression gauge is correctly read and interpreted.

**TASK # ZZ802:** Clean engine and engine parts.

**COMPETENCY:** Clean engine and engine parts by disassembling engine by submerging various parts in cleaning solution and reaming pistons ring grooves.

**CRITERION MEASURE:**

1. Correct separation of the engine parts is completed.
2. Piston ring grooves are correctly reamed.
3. All foreign material is removed from engine and its various parts.

SUBJECT AREA: Overhauling and Maintaining Engines

**TASK # ZZ803:** Clean head.

**COMPETENCY:** Disassemble head and clean by hand, cleaning fluid, or resurfacing.

**CRITERION MEASURE:**

1. Head is disassembled following recommended procedures.
2. Resurfacing the head is done correctly following recommended procedures.
3. All foreign material is removed from the head.

**TASK # ZZ804:** Clean oil and water passages.

**COMPETENCY:** Clean oil and water passages using compressed air.

**CRITERION MEASURE:**

1. Water and oil passages are located.
2. Compressed air is correctly used in water and air passages to remove foreign matter.

**TASK # ZZ805:** Deglaze cylinders.

**COMPETENCY:** Use a cylinder hone to remove oil film surface on cylinder walls.

**CRITERION MEASURE:** Cylinder hone is properly used to remove oil film from cylinder walls.

**TASK # ZZ806:** Determine function of engine parts.

**COMPETENCY:** Identify internal and external engine parts and list the function(s) of each part.

**CRITERION MEASURE:**

1. Internal and external engine parts are correctly identified.
2. The functions of all engine parts are defined.

SUBJECT AREA: Overhauling and Maintaining Engines

**TASK # ZZ807:** Grind valves.

**COMPETENCY:** Use valve grinding machine to face valves for the proper angle specified by the manufacturer.

**CRITERION MEASURE:**

1. The valve grinding machine is used correctly.
2. The face of each valve after grinding has the correct angle.

**TASK # ZZ808:** Identify parts of engine.

**COMPETENCY:** Identify the internal and external parts of engines.

**CRITERION MEASURE:** Internal and external parts of engines are correctly identified.

**TASK # ZZ809:** Install head gasket.

**COMPETENCY:**

1. Install head gasket by aligning proper openings for cylinders, stud bolts, and oil and water cooling openings and use gasket sealer if recommended.
2. Torque cylinder head bolts to manufacturer's specifications.

**CRITERION MEASURE:**

1. Correct head gasket is used.
2. Openings are aligned for cylinders, stud bolts, and oil and water cooling openings.
3. Gasket sealer is properly used if recommended.
4. Cylinder head bolts are torqued to meet manufacturer's specifications.
5. No oil, water, or compression leakage is noted.

TASK # ZZ810: Install valve guides.

COMPETENCY: Press valve guides into valve guides openings in the head with the use of a hydraulic press.

CRITERION MEASURE:

1. Valve guides are installed by correctly using a hydraulic press.
2. Valve guides are seated properly and are not damaged.

TASK # ZZ811: Inspect and measure camshaft bushings.

COMPETENCY:

1. Visually inspect camshaft bushings for nicks or excessive heat.
2. Determine the wear of camshaft bushings by using an inside caliper.

CRITERION MEASURE:

1. Nicks and heat damage are identified.
2. Wear of camshaft bushings is correctly determined or measured by an inside caliper.

TASK # ZZ812: Inspect and measure valve seats.

COMPETENCY: Visually inspect valve seats for burns, excessive wear, and leakage.

CRITERION MEASURE:

1. Burns and excessive wear on valve seats are identified.
2. Valve seat leakage is determined.

SUBJECT AREA: Overhauling and Maintaining Engines

**TASK # ZZ813:** Inspect and replace gaskets.

**COMPETENCY:** Remove old gaskets, identify gasket malfunctions, and replace with new gaskets following recommended procedures.

**CRITERION MEASURE:**

1. Old gaskets are correctly removed.
2. Gasket malfunctions are identified.
3. New gaskets are installed without damage following recommended procedures.

**TASK # ZZ814:** Inspect and replace valve springs.

**COMPETENCY:**

1. Inspect valve springs for malfunction.
2. Use valve spring tester to determine valve spring tension.
3. Use valve spring compressor to compress valve spring. Remove keepers from valve stem. Release tension on valve spring compressor to remove valve spring. Install valve spring by reversing the procedure.

**CRITERION MEASURE:**

1. Valve spring tester is used correctly to determine valve spring tension.
2. Valve springs are removed and replaced by properly using a valve spring compressor.

**TASK # ZZ815:** Inspect camshaft and measure camshaft tolerance.

**COMPETENCY:**

1. Visually inspect camshaft for excessive heat damage and pits.
2. Measure camshaft tolerance by using inside caliper to determine camshaft bearing clearance and outside caliper to determine camshaft bearing journal and note the difference between the two measures.
3. Use a plastic gauge to determine camshaft tolerance following recommended procedures.

**CRITERION MEASURE:**

1. Excessive heat damage and pits are identified by visually inspecting camshaft.
2. Camshaft tolerance is determined by correctly using inside and outside calipers and a plastic gauge.

TASK # ZZ816: Inspect camshaft gear.

COMPETENCY: Visually inspect camshaft gear for teeth chips and broken gears.

CRITERION MEASURE: Damaged camshaft gears are identified.

TASK # ZZ817: Inspect components of rocker arm assembly for defects.

COMPETENCY: Visually identify wear and broken rocker arm parts.

CRITERION MEASURE: Wear and broken rocker arm parts are correctly identified.

TASK # ZZ818: Inspect crankshaft and measure tolerances.

COMPETENCY:

1. Visually inspect crankshaft for damaged and chipped journals.
2. Measure tolerances of crankshaft journals by outside calipers.

CRITERION MEASURE:

1. Damaged and chipped journals are visually identified.
2. Crankshaft journals wear or tolerances are correctly measured by using outside calipers.

TASK # ZZ819: Inspect crankshaft gear.

COMPETENCY: Visually inspect crankshaft gear for teeth chips and broken gears.

CRITERION MEASURE: Damaged crankshaft gears are visually identified.

**TASK # ZZ820:** Inspect cylinder and measure cylinder bore.

**COMPETENCY:**
1. Visually inspect cylinder for wear, defects, and damage.
2. Use inside caliper to measure cylinder bore.

**CRITERION MEASURE:**
1. Wear, defects, and damage to cylinders are positively identified by visual inspection.
2. Cylinder bores are correctly measured by inside calipers.

**TASK # ZZ821:** Inspect engine block.

**COMPETENCY:** Visually inspect engine blocks for cracks and excessive wear.

**CRITERION MEASURE:** Excessive wear and cracks of engine blocks are positively identified by visual inspection.

**TASK # ZZ822:** Inspect flywheel.

**COMPETENCY:** Visually inspect flywheel for missing teeth, broken teeth, and wear.

**CRITERION MEASURE:** Missing teeth, broken teeth, and wear of flywheel are positively identified by visual inspection.

**TASK # ZZ823:** Inspect head and head gasket.

**COMPETENCY:**
1. Visually inspect head for cracks.
2. Visually inspect head gasket for leakage.

**CRITERION MEASURE:**
1. Cracks in head are positively identified.
2. Leaks in head gasket are determined by visual inspection.

SUBJECT AREA: Overhauling and Maintaining Engines

**TASK # ZZ824:** Inspect main bearings and measure main bearing clearance.

**COMPETENCY:**
1. Visually inspect main bearings for wear and damage.
2. Determine main bearing clearance with plastic gauge.

**CRITERION MEASURE:**
1. Wear and damage of main bearings are identified by visual inspection.
2. Main bearing clearance is correctly measured by plastic gauge.

**TASK # ZZ825:** Inspect connecting rods and measure rod bearing clearance.

**COMPETENCY:**
1. Visually inspect connecting rods for wear and bent rods.
2. Determine rod bearing clearance by plastic gauge.

**CRITERION MEASURE:**
1. Connecting rod wear and bent rods are positively identified by visual inspection.
2. Rod bearing clearance is correctly measured by plastic gauge.

**TASK # ZZ826:** Inspect pistons and measure piston tolerances.

**COMPETENCY:**
1. Visually inspect pistons for cracks and burns.
2. Determine piston tolerances by correctly using outside and inside calipers.

**CRITERION MEASURE:**
1. Piston cracks and burns are positively identified by visual inspection.
2. Piston tolerances are correctly measured by properly using outside and inside calipers.

SUBJECT AREA: Overhauling and Maintaining Engines

**TASK # ZZ827:** Inspect piston pins and measure pin tolerances

**COMPETENCY:** Determine wear of piston pins by measuring piston pin tolerances with inside and outside calipers.

**CRITERION MEASURE:** Piston pin wear is correctly determined by measuring piston pin tolerances with inside and outside calipers.

**TASK # ZZ828:** Inspect piston rings and measure piston ring tolerances.

**COMPETENCY:**

1. Visually inspect piston rings for wear and broken rings.
2. Measure piston ring tolerances with a feeler gauge at the ring gaps.

**CRITERION MEASURE:**

1. Piston ring wear and broken rings are positively identified by visual inspection.
2. Piston ring tolerances are correctly measured by using a feeler gauge at the ring gaps.

**TASK # ZZ829:** Inspect ring gear.

**COMPETENCY:** Visually inspect ring gears for wear and broken teeth.

**CRITERION MEASURE:** Ring gear wear and broken teeth are positively identified by visual inspection.

TASK # ZZ830: Lap valves.

COMPETENCY:
1. Apply valve lapping compound on machined valve face.
2. Set valve on valve seat and spin manually by using suction cup.

CRITERION MEASURE:
1. Proper amount of valve lapping compound is correctly applied to machined valve face.
2. Valve is set on valve seat and is spun manually by properly using suction cup.
3. All excess valve lapping compound is removed and surface is clean.

TASK # ZZ831: Measure camshaft end play.

COMPETENCY: Determine excessive camshaft end play by using a dial meter.

CRITERION MEASURE: Excessive camshaft end play is correctly determined by using a dial meter.

TASK # ZZ832: Measure crankshaft end play.

COMPETENCY: Determine excessive crankshaft end play by using a dial meter.

CRITERION MEASURE: Excessive crankshaft end play is correctly determined by using a dial meter.

TASK # ZZ833: Measure oil slinger run-out.

COMPETENCY: Determine the volume of oil that is dispensed from the oil slinger over a specified period of time.

CRITERION MEASURE: The amount of oil dispensed from the oil slinger over a period of time is correctly measured following recommended procedures.

**SUBJECT AREA:** Overhauling and Maintaining Engines

**TASK # ZZ834:** Measure valve guide tolerances.

**COMPETENCY:** Determine valve guide tolerances by using inside and outside calipers following recommended procedures.

**CRITERION MEASURE:** Valve guides and valve stems are correctly measured by inside and outside calipers to determine valve guide tolerances.

**TASK # ZZ835:** Rebore cylinders.

**COMPETENCY:** Use cylinder reboring machine to rebore cylinders to renew cylinder walls.

**CRITERION MEASURE:**

1. The cylinder reboring machine is properly set-up and operated.
2. The engine block is correctly mounted on the cylinder reboring machine.
3. The specified diameter of the cylinder is obtained by proper reboring of the cylinder.

**TASK # ZZ836:** Reface valve seats.

**COMPETENCY:** Reface valve seats by using a proper grinding rock and grind valve seats to the specified angle.

**CRITERION MEASURE:**

1. A proper grinding rock is used and grinding procedures are followed.
2. The valve seats are ground to the specified angle.

SUBJECT AREA: Overhauling and Maintaining Engines

**TASK # ZZ837:** Remove and install camshaft.

**COMPETENCY:**

1. Remove cover from back end of camshaft.
2. Drive camshaft forward with camshaft driving hammer.
3. Remove camshaft from front of engine.
4. Install camshaft from front of engine through camshaft bushings.

**CRITERION MEASURE:**

1. Cover is properly removed from back end of camshaft.
2. The camshaft driving hammer is used correctly and safely to drive camshaft forward.
3. The camshaft is removed without damaging any parts.
4. The camshaft is installed from front of engine following recommended procedures.

**TASK # ZZ838:** Remove and install camshaft bushings.

**COMPETENCY:** Use camshaft bushing driver to remove camshaft bushings from front to rear of engine following recommended procedures.

**CRITERION MEASURE:**

1. Camshaft bushing driver is used correctly.
2. Camshaft bushings are correctly removed from engine following recommended procedures.

**TASK # ZZ839:** Remove and install camshaft gear.

**COMPETENCY:**

1. Remove camshaft and crankshaft gears by sliding gears over the key from back to front of engine.
2. Install camshaft and crankshaft gears by sliding gears over the key from front to back of engine.

**CRITERION MEASURE:**

1. Camshaft gears are removed following recommended procedures.
2. Camshaft gears are installed following recommended procedures.
3. Removal and installation of camshaft gears is completed without damaging engine parts.

SUBJECT AREA: Overhauling and Maintaining Engines

TASK # ZZ840: Remove and install crankshaft.

COMPETENCY:
1. Disassemble engine.
2. Remove crankshaft bearing caps and lift crankshaft from engine.
3. Set crankshaft in bearing journals and install bearing caps in main journals.
4. Reassemble engine.

CRITERION MEASURE:
1. Engine is disassembled correctly following recommended procedures.
2. Crankshaft bearings caps are properly removed.
3. Crankshaft is installed in bearing journals and bearing caps are torqued to manufacturer's specifications.
4. The engine is reassembled correctly.

TASK # ZZ841: Remove and install crankshaft gear.

COMPETENCY:
1. Remove camshaft and crankshaft gears by sliding gears over the key from back to front of engine.
2. Install camshaft and crankshaft gears by sliding gears over the key from front to back of engine.

CRITERION MEASURE:
1. Crankshaft gears are removed following recommended procedures.
2. Crankshaft gears are installed following recommended procedures.
3. Removal and installation of crankshaft gears is completed without damaging engine parts.

SUBJECT AREA: Overhauling and Maintaining Engines

TASK # ZZ842: Remove and install cylinder liners.

COMPETENCY:

1. Disassemble all parts of engine prior to removing liners.
2. Remove wet liners with a wet liner puller.
3. Place rubber seals on new wet liners and push liners into the block manually.
4. Remove dry liners by pressing liners with a hydraulic dry liner press.
5. Install dry liners when they are frozen manually.
6. Reassemble engine.

CRITERION MEASURE:

1. Engine is disassembled correctly following recommended procedures.
2. Wet and dry liners are removed and installed following recommended procedures.
3. Engine is reassembled correctly.

TASK # ZZ843: Remove and install engine.

COMPETENCY:

1. Detach transmission, motor supports, fan, and wiring harnesses.
2. Remove the carburetor, battery cable, ground cable, etc.
3. Attach chain to engine for hoisting.
4. Install engine by reversing the above steps.

CRITERION MEASURE:

1. The transmission, motor supports, fan, and wiring harnesses are detached from the engine following recommended procedures.
2. The carburetor, battery cable, ground cable, etc. are removed from engine following recommended procedures.
3. Engine is safely removed from the vehicle by using a chain hoist.
4. The engine is installed following recommended procedures safely and without damage to any parts.

SUBJECT AREA: Overhauling and Maintaining Engines

**TASK # ZZ844:** Remove and install front and rear oil seals.

**COMPETENCY:**

1. Disassemble the engine and remove the crankshaft.
2. Manually remove front and rear oil seals from bearing caps and journals.
3. Lay rope oil seal or rubber seal in oil seal grooves in front and rear main journals.
4. Replace front and rear main journal bearing caps and torque to manufacturer's specifications.
5. Reassemble engine.

**CRITERION MEASURE:**

1. The engine is disassembled correctly following recommended procedures.
2. The crankshaft is removed correctly.
3. The front and rear oil seals are removed from bearing caps and journals.
4. The front and rear oil seals are installed correctly following recommended procedures.
5. The engine is reassembled correctly following recommended procedures.

**TASK # ZZ845:** Remove and install head.

**COMPETENCY:**

1. Remove valve rocker arm cover.
2. Remove head studs and cylinder head.
3. Install new head gasket.
4. Place head on gasket aligning the studs.
5. Replace head studs and torque to manufacturer's specifications.
6. Replace valve rocker arm cover.

**CRITERION MEASURE:**

1. Valve rocker arm cover is properly removed.
2. Head studs and cylinder head are removed without damaging them or other engine parts.
3. New head gasket is installed following recommended procedures.
4. Head is installed correctly and head bolts torqued to manufacturer's specifications.
5. Valve rocker arm cover is replaced correctly.
6. All safety precautions are followed.

**TASK # ZZ846:** Remove and install piston assembly.

**COMPETENCY:**

1. Remove head and oil pan from engine.
2. Remove rod journal bearing caps.
3. Drive the piston rod through the cylinder exiting from the head opening.
4. Press the piston pins from the piston skirt and the piston rods.
5. Install piston assembly by pressing the pins back through the piston skirt and the piston rods.
6. Replace head and oil pan following recommended procedures.

**CRITERION MEASURE:**

1. Head and oil pan is removed from engine following recommended procedures.
2. Rod journal bearing caps are correctly removed.
3. The piston rod is properly driven through the cylinder.
4. The piston pins are pressed from the piston skirt and the piston rods.
5. The piston assembly is installed following recommended procedures.
6. The head and oil pan are properly replaced.
7. All safety precautions are observed and no damage is done to the engine or its parts.

**TASK # ZZ847:** Remove and install piston rings.

**COMPETENCY:**

1. Disassemble engine, remove heads, intake manifold, oil pan and oil pump.
2. Disconnect rod journals from crankshaft and remove pistons from block through head openings.
3. Use ring expander to remove piston rings.
4. Clean ring grooves before installing new rings.
5. Install piston rings by using a ring expander.
6. Reassemble the engine.

**CRITERION MEASURE:**

1. Engine is properly disassembled to the point of removing the piston rings.
2. Piston rings are correctly removed from pistons.
3. All foreign matter is properly removed from grooves.
4. Piston rings are installed following recommended procedures.
5. Piston rings are positioned correctly on the piston.
6. Engine is reassembled correctly following recommended procedures.
7. Engine operates properly after assembly.
8. Work is completed efficiently and safely and without damaging any engine parts.

**TASK # ZZ848:** Remove and install piston pins.

**COMPETENCY:**

1. Use hydraulic press to remove piston pins from the skirt of the piston and the rods.
2. Install piston pins by using hydraulic press to put piston pins into the skirt of the piston and the rods.

**CRITERION MEASURE:**

1. The hydraulic press is used correctly.
2. Piston pins are removed and installed following recommended procedures.
3. After installation, operation of piston assembly is normal.

**TASK # ZZ849:** Remove and install oil pan.

**COMPETENCY:**

1. Remove oil, loosen studs, remove oil pan and gasket.
2. Replace gasket, position oil pan, replace studs and replace oil in engine.

**CRITERION MEASURE:**

1. Oil pan is removed and installed following recommended procedures.
2. Oil does not leak around the gasket.
3. Oil plug is replaced and oil does not leak around oil plug.

**TASK # ZZ850:** Remove and install valves.

**COMPETENCY:**

1. Remove the head following recommended procedures.
2. Disassemble the head by removing the rocker arm, depress the valve springs with end valve spring depressor, remove the keepers from the stem of the valve, release the valve spring depressor, and remove the valves.
3. Install the valves by reversing the procedure.

**CRITERION MEASURE:**

1. The head is correctly removed.
2. The valves are removed and installed following recommended procedures.
3. The head is installed on the engine.
4. No damage is done to engine parts during repair.
5. After assembly, the engine operates properly.

SUBJECT AREA: Overhauling and Maintaining Engines

**TASK # ZZ851:** Remove and install valve seat inserts.

**COMPETENCY:**
1. Remove the valves from the head.
2. Remove valve seat inserts using appropriate or acceptable methods.
3. Install new valve seat inserts by using a hydraulic press.
4. Replace valves, reassemble head and replace head on engine.

**CRITERION MEASURE:**
1. Valve seat inserts are removed and installed following recommended procedures.
2. Valve seat inserts are pressed to the bottom of the insert chamber.
3. After engine assembly, engine operates normally.

**TASK # ZZ852:** Remove and install rocker arm assembly.

**COMPETENCY:**
1. Remove valve cover.
2. Remove rocker arm stud bolts and lift off rocker arm assembly.
3. Install rocker arm assembly by replacing it, tightening the bolts, and replacing valve cover.

**CRITERION MEASURE:**
1. Valve cover and rocker arm stud bolts are removed using correct wrenches and procedures.
2. Rocker arm assembly is replaced correctly, with all stud bolts being tight.
3. After assembly, engine operates normally.

**TASK # ZZ853:** Remove and install rocker arm cover.

**COMPETENCY:**
1. Remove stud bolts from rocker arm cover and take off cover and gasket.
2. Replace appropriate gasket, place cover gasket and tighten stud bolts.

**CRITERION MEASURE:**
1. Stud bolts are removed and tightened without damaging bolts or cover.
2. A correct gasket is placed around rocker arm assembly.
3. The gasket does not leak following cover replacement.

SUBJECT AREA: Overhauling and Maintaining Engines

**TASK # ZZ854:** Remove and install timing chain.

**COMPETENCY:**

1. Engine is disassembled.
2. Remove harmonic balancer by using wheel puller.
3. Unbolt timing chain cover.
4. Remove timing chain and camshaft and crankshaft sprockets.
5. Replace timing chain and sprockets by following manufacturer's specifications for timing.
6. Replace timing chain cover, harmonic balancer, and reassemble engine.

**CRITERION MEASURE:**

1. Engine is disassembled and reassembled correctly and safely.
2. Timing chain is removed and installed following recommended procedures.
3. Engine is timed correctly following manufacturer's specifications.
4. During procedure, no damage is done to engine parts.
5. After engine assembly, engine runs properly.

**TASK # ZZ855:** Remove and install oil slinger.

**COMPETENCY:**

1. Disassemble engine.
2. Remove bolt from bottom of rod journal cap and remove oil slinger.
3. Install oil slinger by replacing bolt from bottom of rod journal cap.
4. Reassemble engine.

**CRITERION MEASURE:**

1. Engine is disassembled and reassembled correctly.
2. Oil slinger is removed and installed following recommended procedures without damaging parts.
3. After engine is reassembled, engine runs properly.

SUBJECT AREA: Overhauling and Maintaining Engines

**TASK # ZZ856:** Remove and install rod bearing inserts.

**COMPETENCY:**

1. Disassemble engine.
2. Remove oil pan, remove rod bearing caps, and remove the rod bearings from the caps and rod journals.
3. Install new rod bearing inserts in the caps and rod journals and reassemble engine.

**CRITERION MEASURE:**

1. Engine is disassembled and reassembled correctly.
2. Rod bearing inserts are removed and installed using correct procedures and without damaging engine parts.
3. After engine assembly, engine operates normally.

**TASK # ZZ857:** Remove cylinder ridge.

**COMPETENCY:** Remove pistons from engine and use ridge reamer to remove ridge from inside cylinders.

**CRITERION MEASURE:**

1. Engine is disassembled and assembled correctly.
2. Cylinder ridge is removed from inside cylinders by properly using a ridge reamer.
3. All the ridge is removed from the cylinders.
4. All boroughs are removed from the cylinders.
5. After engine reassembly, engine functions properly.

**TASK # ZZ858:** Remove or add shims.

**COMPETENCY:** Remove rod bearing cap or main bearing cap, remove and add shims, and replace bearing caps. Torque to manufacturer's specifications.

**CRITERION MEASURE:**

1. Rod bearing caps and main bearing caps are removed correctly.
2. Shims are removed and replaced correctly.
3. Main or rod bearing clearance is corrected to manufacturer's specifications.

SUBJECT AREA: Overhauling and Maintaining Engines

**TASK # ZZ859:** Remove and replace main bearings.

**COMPETENCY:** Remove bearing caps, remove crankshaft, remove old bearings, replace with new bearings, reassemble and torque.

**CRITERION MEASURE:**

1. Bearing caps, crankshaft and old bearings are removed following recommended procedures.
2. New bearings are installed properly to correct the proper clearance.
3. The studs are torqued to manufacturer's recommendations.

**TASK # ZZ860:** Remove and replace flywheel.

**COMPETENCY:** Separate the engine from the transmission, remove the cluth and pressure plate from the flywheel, remove the flywheel from the crankshaft, replace the flywheel to the crankshaft, and reassemble.

**CRITERION MEASURE:**

1. The engine is correctly separated from the transmission.
2. The clutch and pressure plate are removed from the flywheel following recommended procedures.
3. The flywheel is removed, replaced, and all parts reassembled correctly.

**TASK # ZZ861:** Remove and replace ring gear.

**COMPETENCY:** Remove flywheel, use chisel or cutting torch to cut ring gear, heat new ring gear until all metal is red, place ring gear around flywheel and allow to cool, replace flywheel and reassemble all parts.

**CRITERION MEASURE:**

1. Flywheel is removed following recommended procedures.
2. Chisel and cutting torch is used correctly to cut ring gear from flywheel.
3. Ring gear is heated to the proper degree and placed around flywheel.
4. Flywheel is replaced and all parts are reassembled following recommended procedures.

SUBJECT AREA: Overhauling and Maintaining Engines

TASK # ZZ862: Replace piston pin bushings.

COMPETENCY: Remove pistons and piston rods from engine, remove piston pins by hydraulic or manual press, press piston rod bushings out, press bushings into piston rods, assemble piston and rods, press piston pins through the pistons and the rods, and replace pistons and piston rods into engine.

CRITERION MEASURE:
1. Pistons and piston rods are correctly removed from the engine without damage.
2. Piston pins are removed by correctly using hydraulic or manual presses.
3. Piston rod bushings are pressed out without damage.
4. Bushings are pressed into piston rods and piston and piston rods are reassembled correctly.
5. Piston pins are properly pressed through the pistons and rods.
6. Pistons and piston rods are replaced in engine following recommended procedures.
7. Wrist-pin knock is eliminated.

TASK # ZZ863: Separate and rejoin tractor.

COMPETENCY:
1. Disassemble the steering mechanism, hydraulic connections, and wiring.
2. Remove hood and other obstructions.
3. Support the engine and rear housing.
4. Remove the bolts between the flywheel housing and the engine.
5. Separate the engine from the housing.
6. Align the output shaft with splines in the rear housing to rejoin the tractor.
7. Reassemble all parts in reverse order listed previously.

CRITERION MEASURE:
1. The tractor is separated by disassembling the proper parts following recommended procedures.
2. The tractor is rejoined by reassembling all parts in the correct order following recommended procedures.
3. The tractor functions properly after reassembly.

SUBJECT AREA: Overhauling and Maintaining Engines

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| **TASK # ZZ864:** | Torque rod bearing caps. |
| **COMPETENCY:** | Torque rod bearing caps to PSI recommendations of manufacturer. |
| **CRITERION MEASURE:** | 1. Torque wrench is properly used to torque rod bearing caps.<br>2. All rod bearing caps are torqued to the same PSI specified by manufacturer. |

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| **TASK # ZZ865:** | Torque main bearings. |
| **COMPETENCY:** | Torque main bearing caps to PSI recommendations of manufacturer. |
| **CRITERION MEASURE:** | 1. Torque wrench is properly used to torque main bearings.<br>2. All main bearings are torqued to the same PSI specified by manufacturer. |

| | |
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| **TASK # ZZ866:** | Torque head bolts. |
| **COMPETENCY:** | Torque head bolds to PSI recommendations of manufacturer. |
| **CRITERION MEASURE:** | 1. Torque wrench is properly used to torque head bolts.<br>2. All head bolts are torqued to the same PSI specified by manufacturer. |

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| **TASK # ZZ867:** | Time valve assembly. |
| **COMPETENCY:** | Locate timing marks on timing gears and align timing marks on timing gears to manufacturer's specifications. |
| **CRITERION MEASURE:** | 1. Timing marks are correctly located.<br>2. Timing marks are correctly aligned on timing gears according to manufacturer's specifications.<br>3. The intake valves open on the intake strokes and the exhaust valves open on the exhaust strokes. |

SUBJECT AREA: Repairing and Maintaining Governoring Systems

**TASK # AAA868:** Adjust for proper engine speed.

**COMPETENCY:**

1. Connect RPM gauge to proper terminals.
2. Turn governor adjusting screw and adjust to manufacturer's specified idle RPM.
3. Use RPM gauge under loaded conditions to determine engine speed and adjust governor adjusting screw to allow engine to operate at specified RPM's.

**CRITERION MEASURE:**

1. RPM gauge is connected correctly to proper terminals.
2. RPM gauge is read and interpreted correctly.
3. Governor adjusting screw is adjusted to specified idle RPM's and RPM's under loaded conditions.

**TASK # AAA869:** Inspect components of governor.

**COMPETENCY:** Disassemble governor and inspect components for wear and dirt.

**CRITERION MEASURE:**

1. Governor is disassembled properly according to specified procedures.
2. Presence of dirt and amount of wear of the component parts of the governor are correctly diagnosed by visual inspection.

**TASK # AAA870:** Inspect components of ventilator pump.

**COMPETENCY:** Disassemble ventilator pump properly according to specified procedures.

**CRITERION MEASURE:**

1. Ventilator pump is disassembled properly according to specified procedures.
2. Presence of dirt and amount of wear of the component parts of the ventilator pump are correctly diagnosed by visual inspection.

SUBJECT AREA: Repairing and Maintaining Governoring Systems

**TASK # AAA871:** Measure idler gear end play.

**COMPETENCY:** Use feeler gauge to determine idler gear end play.

**CRITERION MEASURE:** Feeler gauge is used and read properly to determine idler gear end play.

**TASK # AAA872:** Remove and install governor and/or ventilator pump.

**COMPETENCY:**

1. Disassemble governor housing from engine housing.
2. Slide governor from engine.
3. Remove bolts from ventilator pump housing and remove ventilator pump from governor.
4. Install ventilator pump and governor following recommended procedures.

**CRITERION MEASURE:**

1. Governor is disassembled from the engine housing following recommended procedures.
2. Ventilator pump is disassembled from the governor following recommended procedures.
3. Governor and ventilator pump are properly installed.

**TASK # AAA873:** Remove and install governor needle bearings.

**COMPETENCY:**

1. Disassemble the governor, housing, remove the shaft, and remove the needle bearings.
2. Replace the needle bearings by using grease and placing bearings around shaft.

**CRITERION MEASURE:** Governor needle bearings are properly removed and replaced following recommended procedures.

SUBJECT AREA: Repairing and Maintaining Governoring Systems

**TASK # AAA874:** Remove and install ventilator pump idler gear assembly.

**COMPETENCY:** Disassemble ventilator housing, remove idler gear assembly, and replace it following recommended procedures.

**CRITERION MEASURE:** Ventilator pump idler gear assembly is correctly removed and installed following recommended procedures.

**TASK # AAA875:** Replace governor thrust bearings and weights.

**COMPETENCY:** Disassemble the governor housing, remove appropriate component parts, and remove and replace thrust bearings and weights.

**CRITERION MEASURE:**

1. The governor housing and all component parts are properly disassembled and replaced.
2. Governor thrust bearings and weights are correctly removed and replaced.

SUBJECT AREA: Repairing and Maintaining Oil Lubrication Systems

TASK # BBB87[illegible]: Add oil to engines.

COMPETENCY: Check engine oil level and add proper grade and weight of oil if necessary.

CRITERION MEASURE:

1. Engine oil level is identified on dip stick.
2. Proper grade and weight of oil is added to crankcase if needed.
3. After oil is added, engine oil level is at full mark on dip stick.

TASK # BBB877: Change oil and oil filters.

COMPETENCY: Remove oil from crankcase, remove and install filter, and replace proper grade and weight of oil to crankcase.

CRITERION MEASURE:

1. All oil is properly removed from crankcase.
2. Oil filter is removed and an appropriate new filter is properly installed.
3. The correct grade, weight, and amount of oil is selected and properly put into the crankcase.
4. No leakage of oil is noted after the job is completed.

TASK # BBB878: Check oil pressure.

COMPETENCY: Check oil pressure by reading appropriate gauge(s) and compare readings with manufacturer's specifications.

CRITERION MEASURE:

1. Engine oil pressures are read correctly on appropriate gauges.
2. Oil pressure readings are properly interpreted by comparing readings with manufacturer's specifications.

SUBJECT AREA: Repairing and Maintaining Oil Lubrication Systems

**TASK # BBB879:** Clean diesel engine oil cooler.

**COMPETENCY:** Clean diesel oil cooler following manufacturer's recommendations.

**CRITERION MEASURE:** Diesel oil cooler is cleaned of all foreign material following recommended procedures.

**TASK # BBB880:** Inspect components of oil pump.

**COMPETENCY:** Visually inspect the oil pump parts for wear and for a clogged screen.

**CRITERION MEASURE:**

1. The amount of wear of oil pump parts is positively identified.
2. Clogged screens are visually detected.

**TASK # BBB881:** Remove and install diesel engine oil cooler.

**COMPETENCY:** Remove and install diesel engine oil cooler following recommended procedures.

**CRITERION MEASURE:** Diesel engine oil coolers are removed and installed correctly.

**TASK # BBB882:** Remove and install oil pump.

**COMPETENCY:**

1. Locate oil pump, remove oil pan, and disconnect pump.
2. Install new oil pump.

**CRITERION MEASURE:**

1. Oil pump is located.
2. Oil pan is removed.
3. Oil pump is removed from engine.
4. New oil pump is installed properly.

**TASK # BBB883:** Replace drive gear and shaft.

**COMPETENCY:**
1. Remove oil pan and unbolt oil pump from bottom of engine.
2. Remove distributor, slide oil pump down, and remove shaft and drive gear.
3. Replace the drive gear and shaft by reversing the process.

**CRITERION MEASURE:**
1. All component parts are properly removed and replaced.
2. Drive gear and shaft are correctly removed and replaced following recommended procedures.

**TASK # BBB884:** Replace idler gear.

**COMPETENCY:**
1. Remove radiator, fan, belts, crankshaft pulley, and timing chain cover.
2. Loosen nut and remove timing chain idler gear.
3. Replace timing chain idler gear by reversing the procedure.

**CRITERION MEASURE:**
1. All component parts are properly removed and replaced without damage.
2. Timing chain idler gear is correctly removed and replaced.

SUBJECT AREA: Repairing and Maintaining Cooling System

**TASK # CCC885:** Add coolant to system.

**COMPETENCY:** Add coolant to the system in a safe manner in order not to crack the block.

**CRITERION MEASURE:**

1. Appropriate coolant is added to the system when the engine is cold or when the engine is hot and running.
2. The radiator is filled to the proper level with the coolant.
3. The engine block is not cracked because of incorrect adding of the coolant.

**TASK # CCC886:** Back flush cooling system.

**COMPETENCY:** Remove radiator and flush in a vat.

**CRITERION MEASURE:**

1. Radiator is removed without damage.
2. Radiator is flushed with appropriate solution in vat.
3. Radiator is correctly reinstalled to the engine.

**TASK # CCC887:** Clean cooling system with commercial cleaners.

**COMPETENCY:** Clean the radiator and hoses by adding commercial cleaners to the system.

**CRITERION MEASURE:**

1. Appropriate commercial cleaners are chosen and properly added to the cooling system.
2. The cooling system is thoroughly cleaned and free of deposits.
3. Coolant circulates freely in the system.

SUBJECT AREA: Repairing and Maintaining Cooling System

**TASK # CCC888:** Inspect and test system for leaks.

**COMPETENCY:** Visually inspect radiator and hoses for leaks and test system when engine is operating at normal temperature.

**CRITERION MEASURE:**
1. Entire cooling system is visually checked for leaks and possible leaks are noted.
2. Leaks in cooling system are identified by testing system when engine is operating at normal temperature.

**TASK # CCC889:** Inspect components of water pump.

**COMPETENCY:** Examine and inspect the water pump bushing and shaft for wear and leakage.

**CRITERION MEASURE:** Motion of water pump bushing is correctly determined for possible wear and leakage.

**TASK # CCC890:** Install and adjust fan belt.

**COMPETENCY:** Adjust the proper pulley to install the fan belt and adjust belt to obtain the correct tension.

**CRITERION MEASURE:**
1. The proper pulley is located and loosened.
2. The fan belt is aligned on all pulleys.
3. The pulley is adjusted until proper tension is obtained on the belt.
4. The pulley is tightened so that it will not work loose and decrease the tension on the belt.

SUBJECT AREA: Repairing and Maintaining Cooling System

**TASK # CCC891:** Remove and install fan.

**COMPETENCY:**

1. Remove the radiator.
2. Remove the fan.
3. Install the fan to the pulley.
4. Install the radiator.

**CRITERION MEASURE:**

1. The radiator is removed from the engine.
2. The fan is removed from the pulley without damaging the pulley.
3. The fan is properly installed on the pulley and the radiator is correctly installed.

**TASK # CCC892:** Remove and install radiator.

**COMPETENCY:**

1. Drain the radiator of coolant.
2. Disconnect the water hoses.
3. Locate the radiator bolts and remove them.
4. Remove the radiator without damaging it.
5. Install the radiator by reversing the process.

**CRITERION MEASURE:**

1. Drain plug is located and coolant is removed from the radiator.
2. Water hoses are disconnected without puncturing holes in the hoses or damaging the connectors.
3. The radiator bolts are located and removed.
4. The radiator is removed without damage.
5. The radiator is properly installed and water hose connections made without damaging nipples or hoses.
6. After installation, the radiator or hoses do not leak.

**TASK # CCC893:** Remove and install thermostats.

**COMPETENCY:** Locate the thermostat in top radiator inlet, remove the proper system components, and remove and install thermostat.

**CRITERION MEASURE:**

1. The thermostat is correctly located.
2. The proper component parts are disconnected without damaging them and the thermostat is correctly removed and replaced.
3. After installation, no leaks are observed in the system.

**SUBJECT AREA: Repairing and Maintaining Cooling System**

**TASK # CCC894:** Remove and install water pump.

**COMPETENCY:**

1. Remove component parts of the cooling system - radiator, belts, fan, pulleys,
2. Remove bolts and take out water pump from engine.
3. Install water pumps and replace component parts of the cooling system.

**CRITERION MEASURE:**

1. Appropriate component parts of the cooling system are properly removed without damage.
2. The water pump is correctly removed and installed.
3. Component parts of the cooling system are replaced properly and without damage.

**TASK # CCC895:** Replace water pump impeller.

**COMPETENCY:**

1. Press shaft from water pump by using hydraulic or manual press.
2. Remove old impeller and replace it by pressing shaft through new impeller.

**CRITERION MEASURE:**

1. Shaft from water pump is pressed out by properly using hydraulic or manual press.
2. Old impeller is removed from pump and new one is inserted by following recommended procedures.

**TASK # CCC896:** Replace water pump seal and bearings.

**COMPETENCY:**

1. Press shaft from water pump by using hydraulic or manual press.
2. Remove seal and bearing by driving seal out and pulling bearing.
3. Press seal and bearing into housing and replace shaft.

**CRITERION MEASURE:**

1. Shaft from water pump is pressed out by properly using hydraulic or manual press.
2. Seal and bearing are removed by following recommended procedures.
3. New seal and bearing are replaced following recommended procedures.
4. Rotation of water pump shaft operates freely.

SUBJECT AREA: Repairing and Maintaining Cooling System

**TASK # CCC897:** Replace radiator hoses.

**COMPETENCY:**

1. Remove radiator hose clamps.
2. Remove hose from inlet and outlet nipple.
3. Select correct hose and place on inlet and outlet nipples.
4. Replace hose clamps.

**CRITERION MEASURE:**

1. Radiator hose clamps are removed without damaging the clamps or the screw.
2. Radiator hose is removed without damaging nipples.
3. Correct radiator hoses are selected to replace old hoses.
4. New hoses are installed and clamps replaced without damaging hoses, nipples, or clamps.
5. New hoses do not leak.

**TASK # CCC898:** Test thermostats.

**COMPETENCY:** Submerge thermostat into water at the temperature setting of the thermostat and observe the diaphragm to determine if the thermostat opens and allows water to flow.

**CRITERION MEASURE:** Thermostats are tested following recommended procedures and correct diagnosis is made concerning operation of thermostat.

SUBJECT AREA: Repairing and Maintaining Gas and Diesel Fuel Systems

**TASK # DDD899:** Adjust carburetors.

**COMPETENCY:** Connect vacuum gauge, regulate air intake screw, regulate fuel adjustment screw, and adjust to manufacturer's vacuum specifications.

**CRITERION MEASURE:**

1. Vacuum gauge is connected correctly to vacuum line.
2. Air intake screw and fuel adjustment screw are correctly identified and located.
3. Vacuum gauge is properly read and interpreted.
4. Fuel-air mixture is adjusted until correct vacuum is obtained.

**TASK # DDD900:** Bleed fuel system.

**COMPETENCY:**

1. Loosen fuel line connection at the injector.
2. Turn engine until air bubbles disapate and tighten fuel line connection.
3. Loosen fuel line coupling on injector pump.
4. Turn engine until air bubbles disapate and tighten fuel line coupling.

**CRITERION MEASURE:**

1. Fuel line connections and couplings are correctly loosened.
2. Engine is turned until all air bubbles disapate.
3. Fuel line connections and couplings are tightened properly.
4. Engine starts when air has been eliminated from fuel system.

**TASK # DDD901:** Clean carburetor.

**COMPETENCY:** Disassemble carburetor, immerse parts in carburetor cleaning fluid, remove parts and dry with air, and reassemble.

**CRITERION MEASURE:**

1. Carburetor parts are identified and functions specified.
2. Carburetor is disassembled correctly.
3. Parts are cleaned of all foreign matter.
4. Carburetor is reassembled correctly.

SUBJECT AREA: Repairing and Maintaining Gas and Diesel Fuel Systems

TASK # DDD902: Clean sediment bowl and screen.

COMPETENCY:
1. Release the sediment bowl band and remove the sediment bowl and screen.
2. Submerge bowl and screen in cleaning fluid to remove all foreign matter.
3. Reassemble sediment bowl and screen.

CRITERION MEASURE:
1. Sediment bowl and screen are correctly removed.
2. All foreign matter is removed from bowl and screen.
3. Sediment bowl is reassembled correctly.

TASK # DDD903: Determine purpose of various parts.

COMPETENCY: Identify the parts and the purpose of each part of the fuel system.

CRITERION MEASURE:
1. The parts of the fuel system are identified correctly.
2. The function or purpose of each part is provided correctly.

TASK # DDD904: Identify parts of fuel system.

COMPETENCY: Identify the parts of the fuel system by visual inspection.

CRITERION MEASURE: The parts of fuel systems are correctly identified.

TASK # DDD905: Inspect carburetor parts for defects.

COMPETENCY: Visually inspect carburetor parts for wear and malfunction.

CRITERION MEASURE: All carburetor parts are correctly identified for wear and malfunctions are diagnosed.

**SUBJECT AREA:** Repairing and Maintaining Gas and Diesel Fuel Systems

**TASK # DDD906:** Inspect manifolds.

**COMPETENCY:** Determine if intake and exhaust manifolds are warped, cracked, or have blown gaskets.

**CRITERION MEASURE:** Manifolds are identified that are warped, cracked, or leak.

**TASK # DDD907:** Install carburetor repair kit.

**COMPETENCY:** Disassemble carburetor, replace float, needle valve, needle valve seat, and carburetor jets and reassemble carburetor.

**CRITERION MEASURE:**

1. Carburetor is disassembled correctly.
2. Carburetor parts are replaced according to recommended procedures.
3. Carburetor is reassembled correctly.
4. Engine receives the proper air-fuel mixture.

**TASK # DDD908:** Remove and install diesel fuel pump.

**COMPETENCY:**

1. Disconnect inlet and outlet fuel lines.
2. Disconnect diesel fuel pump from the engine housing.
3. Install diesel fuel pump.

**CRITERION MEASURE:**

1. Inlet and outlet fuel lines are disconnected correctly.
2. Diesel fuel pump is disconnected from engine housing following recommended procedures.
3. New diesel fuel pump is installed following recommended procedures.

SUBJECT AREA: Repairing and Maintaining Gas and Diesel Fuel Systems

TASK # DDD909: Remove and install fuel tank.

COMPETENCY:

1. Disconnect fuel lines and remove mounting brackets.
2. Remove fuel tank and replace by reconnecting brackets and connecting fuel lines.

CRITERION MEASURE:

1. Fuel lines are disconnected and reconnected without leakage.
2. Mounting brackets are removed and reconnected properly.
3. Fuel tank is removed and replaced without damage or leakage.
4. All safety precautions are observed.

TASK # DDD910: Remove and install gas fuel pump.

COMPETENCY:

1. Disconnect inlet and outlet fuel lines.
2. Disconnect fuel pump from the engine housing.
3. Install gas fuel pump.

CRITERION MEASURE:

1. Inlet and outlet fuel lines are disconnected correctly.
2. Gas fuel pump is disconnected from engine housing following recommended procedures.
3. New gas fuel pump is installed following recommended procedures.

TASK # DDD911: Remove and install manifolds.

COMPETENCY:

1. Disconnect carburetor from intake manifold.
2. Disconnect intake manifold from heads.
3. Remove and replace gaskets.
4. Install intake manifold and replace carburetor.
5. Disconnect exhaust manifold pipe from exhaust manifold.
6. Disconnect exhaust manifold from the heads.
7. Remove and replace gaskets.
8. Install exhaust manifolds and reconnect exhaust manifold pipe.

CRITERION MEASURE:

1. Intake manifold is removed and replaced following recommended procedures and without leakage.
2. Exhaust manifolds are removed and replaced following recommended procedures and without leakage.

SUBJECT AREA: Repairing and Maintaining Gas and Diesel Fuel Systems

**TASK # DDD912:** Remove and install injection nozzles.

**COMPETENCY:**
1. Remove fuel line from injection nozzle.
2. Remove injection nozzle from block.
3. Install new nozzle following recommended procedures and reconnect fuel line to injection nozzle.

**CRITERION MEASURE:** Injection nozzles are removed and replaced following recommended procedures and without leakage.

**TASK # DDD913:** Clean injection nozzles.

**COMPETENCY:** Disassemble injection nozzles, clean, and reassemble.

**CRITERION MEASURE:**
1. Injection nozzles are disassembled correctly.
2. Injection nozzles are cleaned and free of foreign particles.
3. Injection nozzles are reassembled correctly following recommended procedures.

**TASK # DDD914:** Replace fuel filters.

**COMPETENCY:** Disconnect fuel lines from fuel filter, select new fuel filter, and reconnect fuel lines to new filter.

**CRITERION MEASURE:**
1. Fuel filters are selected that meet manufacturer's specifications.
2. Fuel lines are disconnected from old fuel filter and reconnected to new filter without damaging lines or the filter.

SUBJECT AREA: Repairing and Maintaining the Gas and Diesel Fuel Systems

TASK # DDD915: Replace fuel lines.

COMPETENCY: Disconnect fuel lines, select appropriate new lines, and connect new lines.

CRITERION MEASURE:

1. New fuel lines are selected that meet manufacturer's specifications.
2. Fuel lines are disconnected and reconnected correctly without damage to the lines or other fuel system parts.

TASK # DDD916: Replace fuel system warning devices.

COMPETENCY:

1. Disconnect wire terminals.
2. Remove warning device from mountings.
3. Select new warning device, install device, and reconnect wire terminals.

CRITERION MEASURE:

1. New fuel system warning devices are selected that meet manufacturer's specifications.
2. Fuel system warning devices are removed and replaced following recommended procedures and without damage.

TASK # DDD917: Replace needle bearings.

COMPETENCY:

1. Remove old needle bearings and clean race.
2. Lay new needle bearings in race and stick them together with ninety pound grease.

CRITERION MEASURE:

1. All bearings are removed and race is free of all foreign matter.
2. Correct number of needle bearings are inserted in race correctly.

SUBJECT AREA: Repairing and Maintaining Gas and Diesel Fuel Systems

**TASK # DDD918:** Run manifold vacuum test.

**COMPETENCY:**

1. Connect vacuum gauge in gauge intake manifold lines.
2. Run engine; read vacuum gauge and compare gauge reading with manufacturer's specifications.

**CRITERION MEASURE:**

1. Vacuum gauge is connected correctly to intake manifold line.
2. Vacuum gauge is properly read and interpreted.

**TASK # DDD919:** Service air cleaner.

**COMPETENCY:**

1. Remove oil air cleaner from the engine, disassemble, wash and add oil to specified level.
2. Reassemble oil air cleaner and replace on engine.

**CRITERION MEASURE:**

1. Oil air cleaner is properly removed from engine.
2. Oil air filter parts are identified correctly.
3. Oil air filter is correctly disassembled.
4. Oil air filter is cleaned properly and free of foreign matter.
5. Oil air filter is reassembled correctly and replaced on engine properly.

**TASK # DDD920:** Test diesel fuel injection pump.

**COMPETENCY:**

1. Remove diesel fuel injection pump from engine when necessary.
2. Test pump with flowmeter and pressure gauge to determine if pump meets manufacturer's specifications.
3. Replace pump on engine correctly if removed.

**CRITERION MEASURE:**

1. Correct determination is made on whether the diesel fuel injection pump should be removed from the engine for testing.
2. Diesel fuel injection pump is removed from engine correctly.
3. Flowmeter and pressure gauge are correctly connected.
4. Flowmeter and pressure gauge are read and interpreted correctly and readings compared to manufacturer's specifications.
5. Diesel fuel injection pump is replaced correctly on engine.

SUBJECT AREA: Repairing and Maintaining Gas and Diesel Fuel Systems

TASK # DDD921: Test fuel pump.

COMPETENCY: Disconnect fuel pump discharge, turn engine, and visually determine if fuel is being pumped.

CRITERION MEASURE:
1. Fuel pump discharge is properly disconnected.
2. Proper diagnosis is made on determining operation of fuel pump.

TASK # DDD922: Test injection nozzles.

COMPETENCY: Test injection nozzles on appropriate test equipment to determine specific spray patterns and outputs and compare with manufacturer's specifications.

CRITERION MEASURE:
1. Appropriate test equipment is chosen to test injection nozzles for specific spray patterns and outputs.
2. Tests are run correctly according to specified procedures.
3. Test results are compared correctly with manufacturer's specifications.

TASK # DDD923: Time injection pump.

COMPETENCY: Time injection pump by setting or adjusting the regulator on the pump to spray the pattern prior to top dead center of the piston.

CRITERION MEASURE: Injection pump is timed to assure complete combustion.

## SUBJECT AREA: Selection of Poultry Flock

**TASK # EEE924:** Identify breeds.

**COMPETENCY:**
1. Visually identify specified breeds of poultry by their common names.
2. Spell correctly the common names of specified breeds of poultry.

**CRITERION MEASURE:**
1. Specified breeds of poultry are correctly identified by visual inspection.
2. Common names of specified breeds of poultry are spelled correctly.

**TASK # EEE925:** Evaluate advantages and disadvantages of different breeds of poultry.

**COMPETENCY:** Determine the advantages and disadvantages of specified meat breeds and egg breeds of poultry.

**CRITERION MEASURE:** The advantages and disadvantages of specified meat breeds and egg breeds of poultry are correctly listed and discussed.

**TASK # EEE926:** Determine factors for meat production.

**COMPETENCY:**
1. Identify and discuss the factors that are important in selecting meat producing poultry flocks.
2. Analyze meat breeds and select breeds that have outstanding qualities for meat production.

**CRITERION MEASURE:**
1. The factors that are important in selecting meat producing poultry flocks are correctly listed and discussed.
2. Meat breeds are analyzed and breeds are selected that have outstanding meat producing characteristics.

SUBJECT AREA: Selection of Poultry Flock

TASK # EEE927: Determine factors for egg production.

COMPETENCY:

1. Identify and discuss the factors that are important in selecting egg producing poultry flocks.
2. Analyze specified egg producing breeds and select the breeds that have outstanding egg producing qualities.

CRITERION MEASURE:

1. The factors that are important in selecting egg producing poultry flocks are correctly listed and discussed.
2. Egg producing breeds are analyzed and breeds are selected that have outstanding egg producing characteristics.

SUBJECT AREA: Care of Newly Hatched Chicks

TASK # FFF928: Determine brooder house space requirements.

COMPETENCY: Determine the size of the brooder house for a specified number of chicks.

CRITERION MEASURE:

1. The recommended amount of space to provide each chick in the brooder house is correctly provided.
2. Brooder house size requirements for specified numbers of chicks are correctly determined.

TASK # FFF929: Provide appropriate temperature and ventilation.

COMPETENCY:

1. Determine the recommended temperature and ventilation requirements for chicks in the brooder house.
2. Maintain the equipment to provide the required temperature and ventilation.

CRITERION MEASURE:

1. The recommended temperature and ventilation requirements for chicks in the brooder house are correctly listed.
2. Mechanical equipment is properly adjusted to provide the recommended temperature and ventilation requirements in the brooder house.

TASK # FFF930: Determine feed and water requirements.

COMPETENCY:

1. Determine feed and water recommended requirements for specified numbers of chicks of different ages in the brooder house.
2. Provide the amount of feed and water needed for specified numbers of chicks of different ages in the brooder house.

CRITERION MEASURE:

1. Feed and water recommended requirements for specified numbers of chicks of different ages are correctly calculated.
2. The amount of feed and water required for specified numbers of chicks of different ages in the brooder house is provided.
3. Automatic feeders and waterers are properly controlled to provide recommended amounts of feed and water.

SUBJECT AREA: Care of Newly Hatched Chicks

**TASK # FFF931:** Determine the amount of lighting needed.

**COMPETENCY:**

1. Determine the recommended amount of light needed for different aged chicks in the brooder house.
2. Operate lighting equipment and set automatic timers to provide the recommended amount of light required for different aged chicks.
3. Provide the effects of variations of lighting on chicks.

**CRITERION MEASURE:**

1. The recommended amount of light needed for different aged chicks in the brooder house is correctly provided.
2. Lighting equipment is correctly operated and automatic timers are adjusted and set to provide the recommended amount of light for different aged birds.
3. The effects of variation of lighting on chicks are correctly listed and discussed.

**TASK # FFF932:** Maintain proper bedding.

**COMPETENCY:** Use and maintain proper bedding in the brooding house.

**CRITERION MEASURE:**

1. Bedding materials that are recommended to be used in the brooding house are listed.
2. Soiled bedding is recognized and is properly removed from the house.
3. The proper depth in bedding is maintained and the amount of bedding materials needed for the house is correctly calculated.
4. Reasons for maintaining proper bedding are correctly listed and discussed.

SUBJECT AREA: Care of Newly Hatched Chicks

TASK # FFF933: Vaccinate chicks.

COMPETENCY:
1. Determine the recommended method or methods to vaccinate chicks for different types of diseases.
2. Determine the recommended schedule for vaccinating chicks for specified diseases.
3. Prepare the vaccine and the dosage according to recommendations.
4. Properly vaccinate chicks for different diseases.

CRITERION MEASURE:
1. The recommended methods of vaccinating chicks for different diseases are provided.
2. Recommended schedules for vaccinating chicks for specified diseases are correctly listed.
3. Vaccine is properly prepared following recommended procedures and correct dosages are determined.
4. Chicks are correctly vaccinated for different diseases.

TASK # FFF934: Debeak and sex chicks.

COMPETENCY:
1. List the reasons for debeaking and sexing chicks.
2. Debeak and sex chicks at the recommended age following recommended procedures.

CRITERION MEASURE:
1. The reasons for debeaking and sexing chicks are correctly listed.
2. Chicks are properly handled without injuring them for debeaking and sexing.
3. Chicks are debeaked correctly by properly using debeaking equipment.
4. Chicks are debeaked at the recommended length.
5. Male and female chicks are correctly determined and the recommended sex ratio in flocks is listed.

**TASK # GGG935:** Determine broiler house space requirements.

**COMPETENCY:**

1. Determine the recommended per bird space requirements for different aged birds in broiler houses.
2. Determine the broiler house size requirements for specified numbers of different aged birds.

**CRITERION MEASURE:**

1. The recommended per bird space requirements for different aged broilers are correctly listed.
2. Broiler house size requirements for specified numbers of different aged birds are correctly calculated.

**TASK # GGG936:** Determine amount of lighting needed.

**COMPETENCY:**

1. Determine the recommended amount of light needed for different aged broilers.
2. Operate lighting equipment and set automatic timers to provide the recommended amount of light required for different aged broilers.
3. Provide the effects of variations of lighting on broilers.

**CRITERION MEASURE:**

1. The recommended amount of light needed for different aged broilers is correctly provided.
2. Lighting equipment is correctly operated and automatic timers are adjusted and set to provide the recommended amount of light for different aged broilers.
3. The effects of variation of lighting on broilers are correctly listed and discussed.

**TASK # GGG937:** Provide appropriate temperature and ventilation.

**COMPETENCY:**

1. Determine the recommended temperature and ventilation requirements for different aged broilers.
2. Operate and maintain the equipment to provide the required temperature and ventilation.
3. List the effects of temperature and ventilation on broilers.

**CRITERION MEASURE:**

1. The recommended temperature and ventilation requirements for different aged broilers are correctly listed.
2. Mechanical equipment is properly operated, adjusted, and maintained and correct temperature and ventilation are provided in the broiler house.
3. The effects of temperature and ventilation on broilers are correctly listed and discussed.

**TASK # GGG938:** Provide adequate feeders and drinkers and maintain them.

**COMPETENCY:**

1. Determine the recommended footage of feeders and waterers for specified numbers of different aged broilers.
2. Clean feeders and waterers and keep them in proper operating condition.

**CRITERION MEASURE:**

1. The recommended footages of feeders and waterers for specified numbers of different aged broilers is correctly calculated.
2. Feeders and waterers are cleaned as needed and are free of litter and other foreign matter.
3. Feeders and waterers are properly maintained and repair work is correctly completed as needed.

**TASK # GGG939:** Determine feed requirements of different weights and ages.

**COMPETENCY:**

1. Determine the amount of feed required per bird for specified periods of time for different weights and ages of broilers.
2. Determine the total amount of feed required for specified periods of time for specified numbers of different ages and weights of broilers.
3. Determine the recommended nutritional requirements for different ages and sizes of broilers.

**CRITERION MEASURE:**

1. The amount of feed required per bird for specified periods of time for different weights and ages of broilers is correctly provided.
2. The total amount of feed required for specified periods of time for specified numbers of different ages and weights of broilers is correctly calculated.
3. The recommended nutritional requirements for different ages and weights of broilers are correctly listed.

**TASK # GGG940:** Provide routine medication and parasite control.

**COMPETENCY:**

1. Determine the recommended routine medication and parasite control schedule for broilers.
2. Determine the diseases or other conditions the medication is used for and the types of parasites controlled.
3. Determine the dosage, time of application, and withdrawal period.
4. Administer the medication according to recommended procedures.
5. List and discuss the reasons for providing routine medication and parasite control to broilers.

**CRITERION MEASURE:**

1. The recommended routine medication and parasite control schedule for broilers is listed.
2. The diseases, other conditions, and parasites that should be routinely controlled are correctly provided.
3. The medication is administered according to recommended procedures.
4. The dosage, time of application, and withdrawal period are correctly determined.
5. The reasons for providing routine medication and parasite control are correctly listed and discussed.

TASK # GGG941: Keep feed consumption and growth records.

COMPETENCY:
1. Measure feed consumption daily for broilers and record data on recommended forms.
2. Measure growth of broilers periodically as recommended and record data on recommended forms.
3. Calculate weight of gain per pound of feed consumption.

CRITERION MEASURE:
1. Feed consumption for specified numbers of broilers is measured accurately and data is correctly recorded on recommended forms.
2. Specified broilers are weighed periodically as recommended, weights are recorded on recommended forms, and weight gains are correctly calculated over specified periods of time.
3. Weight gain for specified broilers per pound of feed consumed is correctly calculated.

TASK # GGG942: Maintain proper bedding.

COMPETENCY: Use and maintain proper bedding in broiler houses.

CRITERTION MEASURE:
1. Bedding materials that are recommended in broiler houses are correctly listed.
2. Soiled bedding is recognized and is properly removed from the house.
3. Proper bedding materials are added as needed or periodically according to recommended schedules.
4. Machinery used to remove and put in bedding materials is operated safely and efficiently.
5. The amount of bedding materials to use is correctly calculated.
6. Reasons for maintaining proper bedding are correctly listed and discussed.

**TASK # GGG943:** Dispose of diseased birds properly.

**COMPETENCY:**

1. Determine local, state, and federal laws that affect disposing of diseased birds.
2. List and discuss proper methods of disposing of diseased birds.
3. Recognize diseased birds and remove them from the flock.
4. Properly dispose of diseased birds in the manner that is best for the operation.
5. Provide the reasons for removing diseased birds from the flock and properly disposing of them.

**CRITERION MEASURE:**

1. Local, state, and federal laws that provide policies for disposing of diseased chickens are listed and the provisions are listed and discussed.
2. The proper methods of disposing of diseased birds are listed and discussed.
3. Diseased birds in the flock are identified and are properly removed from the flock.
4. Diseased birds are properly disposed of in that manner that is best for the operation.
5. Reasons for removing diseased birds from the flock and properly disposing of them are listed.

**TASK # GGG944:** Properly water and feed flock.

**COMPETENCY:**

1. Adjust and set automatic controls on feeders.
2. Regulate water flow and water pressure.
3. Keep water to broilers at all times.

**CRITERION MEASURE:**

1. Automatic controls are properly adjusted and set on feeders.
2. Correct water flow and water pressure is maintained on automatic waterers.
3. Water is available to broilers at all times.
4. The operation and mechanics of the feeding and watering equipment is explained and discussed.

SUBJECT AREA: Broiler Production

TASK # GGG945: Weigh and grade poultry for market.

COMPETENCY:

1. Weigh birds that are ready for market and record weights.
2. List and provide the characteristics of broiler grades for live birds and carcasses.
3. Visually grade live broilers and carcasses.

CRITERION MEASURE:

1. Birds are correctly handled, weighed, and live weights are correctly recorded.
2. Broiler grades for live birds and carcasses are correctly listed and characteristics of each grade provided.
3. Live broilers and carcasses are correctly graded by visual inspection.

SUBJECT AREA: Pullet and Egg Production

**TASK # HHH946:** Determine proper space requirements.

**COMPETENCY:**

1. Determine the recommended per bird space requirements for different size, age, and type of pullets and hens.
2. Determine the size of house requirements for specified numbers of size, age, and type of pullets and hens.
3. List and discuss the effects of proper and improper space for pullets and hens.

**CRITERION MEASURE:**

1. The recommended per bird space requirements for different size, age, and type of pullets and hens are listed.
2. The house size requirements for specified numbers of size, age, and type of pullets and hens are correctly calculated.
3. The effects of proper and improper space for pullets and hens are correctly listed and discussed.

**TASK # HHH947:** Segregate poultry into groups according to weight, age, and sex.

**COMPETENCY:**

1. Identify age, sex, and weight of poultry.
2. Group poultry into age, sex, and weight classes.

**CRITERION MEASURE:**

1. Poultry are correctly identified by age and sex.
2. Poultry are correctly weighted and weights recorded.
3. Poultry are properly handled and grouped according to age, sex, and weight categories.

SUBJECT AREA: Pullet and Egg Production

TASK # HHH948: Attach identification bands to legs or wings.

COMPETENCY:
1. Determine the type of identification system to use that is best for the farm.
2. Determine the types of bands available and choose a band that is suitable.
3. Use attachment equipment properly to attach the bands.

CRITERION MEASURE:
1. The type of identification system that is best for the farming operation is selected.
2. The types of bands available are listed and the one most suitable for the specified operation is chosen.
3. Attachment equipment is properly used to attach bands.
4. Bands are properly placed on legs or wings and are securely held in place.
5. Chickens are handled properly without injury for the procedure.

TASK # HHH949: Clip wings.

COMPETENCY:
1. Provide reasons for clipping wings.
2. Operate clippers correctly following recommended procedures for clipping.
3. Clip wings at the proper length and during the proper age of chickens.

CRITERION MEASURE:
1. Reasons for clipping wings of chickens are correctly listed and discussed.
2. Clippers are operated correctly and safely.
3. Wings are clipped at the correct length following recommended procedures.
4. The age of chickens when wings should be clipped is provided.
5. Chickens are handled carefully without injury for wing clipping.

**TASK # HHH950:** Maintain routine disease and parasite control.

**COMPETENCY:**

1. Determine the recommended routine medication and parasite control schedule for pullets and hens.
2. Determine the diseases and other conditions the medication is used for and the types of parasites controlled.
3. Determine the dosage, time of application, and withdrawal period.
4. Administer the medication according to recommended procedures.
5. List and discuss the reasons for providing routine medication and parasite control.

**CRITERION MEASURE:**

1. The recommended routine medication and parasite control schedule is listed.
2. The diseases, other conditions, and parasites that should be routinely controlled are correctly provided.
3. The medication is administered following recommended procedures.
4. The dosage, time of application, and withdrawal period are correctly determined.
5. The reasons for providing routine medication and parasite control are correctly listed and discussed.

**TASK # HHH951:** Provide proper lighting for sexual development and egg production.

**COMPETENCY:**

1. Determine the recommended amount of light needed for sexual development and egg production.
2. Operate lighting equipment and set automatic timers to provide the recommended amount of light for sexual development and egg production.
3. Provide the effects of variation of lighting on sexual development and egg production.

**CRITERION MEASURE:**

1. The recommended amount of light needed for sexual development and egg production is correctly determined.
2. Lighting equipment is correctly operated and automatic timers are adjusted and set to provide the recommended amount of light.
3. The effects of variations of lighting on sexual development and egg production are correctly listed and discussed.

**TASK # HHH952:** Determine when pullets are mature for egg production.

**COMPETENCY:**
1. Determine the age at which specified types of pullets are normally mature for egg production.
2. For specified pullets, determine when they are mature for egg production.

**CRITERION MEASURE:**
1. The age at which specified types of pullets are normally mature for egg production is correctly listed.
2. Specified pullets are correctly determined when they are mature for egg production.

**TASK # HHH953:** Maintain proper bedding.

**COMPETENCY:** Use and maintain proper bedding in pullet and hen houses.

**CRITERION MEASURE:**
1. Bedding materials that are recommended in pullet and hen houses are correctly listed.
2. Soiled bedding is recognized and is properly removed from the house.
3. Proper bedding materials are added as needed or periodically according to recommended schedules.
4. Machinery used to remove and put in bedding materials is operated safely and efficiently.
5. The amount of bedding materials to use is correctly calculated.
6. Reasons for maintaining proper bedding are correctly listed and discussed.

**TASK # HHH954:** Determine feed requirements.

**COMPETENCY:**

1. Determine the amount of feed required per bird for specified periods of time for different weights, ages, and types of pullets and hens.
2. Determine the total amount of feed required for specified periods of time for specified numbers of different ages, weights, and types of pullets and hens.
3. Determine the recommended nutritional requirements for different ages, weights, and types of pullets and hens.

**CRITERION MEASURE:**

1. The amount of feed required per bird for specified periods of time for different ages, weights, and types of pullets and hens is correctly provided.
2. The total amount of feed required for specified periods of time for specified numbers of different ages, weights, and types of pullets and hens is correctly calculated.
3. The recommended nutritional requirements for different ages, weights, and types of pullets and hens are correctly listed.

**TASK # HHH955:** Provide appropriate temperature and ventilation.

**COMPETENCY:**

1. Determine the recommended temperature and ventilation requirements for different ages, weights, and types of pullets and hens.
2. Operate and maintain the equipment to provide the required temperature and ventilation.
3. List the effects of adequate and inadequate temperature and ventilation on specified pullets and hens.

**CRITERION MEASURE:**

1. The recommended temperature and ventilation requirements for different ages, weights, and types of pullets and hens are correctly listed.
2. Mechanical equipment is properly operated, adjusted, and maintained and correct temperatures and ventilation are provided for specified pullets and hens.
3. The effects of adequate and inadequate temperature and ventilation on specified pullets and hens are correctly listed and discussed.

**SUBJECT AREA: Pullet and Egg Production**

TASK # HHH956: Provide appropriate feeders and drinkers.

COMPETENCY:
1. Determine the recommended footage of feeders and waterers for specified numbers and different ages, weights, and types of pullets and hens.
2. Clean feeders and waterers and keep them in proper operating condition.

CRITERION MEASURE:
1. The recommended footages of feeders and waterers for specified numbers of different ages, weights, and types of hens and pullets are correctly calculated.
2. Feeders and waterers are cleaned as needed and are free of litter and other foreign matter.
3. Feeders and waterers are properly maintained and repair work is correctly completed as needed.

TASK # HHH957: Properly maintain feeders and drinkers.

COMPETENCY:
1. Keep feeders and waterers clean and free of chicken litter, shavings, and other foreign matter.
2. Adjust and repair feeders and waterers as needed to keep them in proper operating condition.

CRITERION MEASURE:
1. Feeders and waterers are cleaned following recommended procedures and are free of chicken litter, shavings, and other foreign matter.
2. Feeders and waterers are properly adjusted and repaired as needed and they are kept in proper operating condition.
3. Routine maintenance is performed on feeders and waterers following recommended procedures.

**TASK # HHH958:** Provide appropriate nests and maintain bedding in nests.

**COMPETENCY:**

1. Determine the recommended number of hens that may serve one nest.
2. Determine the number of nests needed for a specified number of hens.
3. Determine the type of bedding materials to use in nests and the amount of bedding to use.
4. Install nests following recommended installation procedures and recommended sizes for different types of hens.
5. Clean nests as needed or as recommended by removing old bedding and replacing it with fresh bedding.

**CRITERION MEASURE:**

1. The recommended number of hens that serve one nest is correctly listed.
2. The total number of nests needed for specified numbers of hens is correctly calculated.
3. The types and amounts of bedding materials to use in nests are correctly determined.
4. Procedures for installing nests are listed and correctly demonstrated.
5. Sizes of nests for different types of hens are listed.
6. Nests are properly cleaned and proper bedding is restored.

**TASK # HHH959:** Gather and clean eggs.

**COMPETENCY:**

1. Use automated equipment to gather eggs and gather eggs by hand and place in flats.
2. Wash eggs by automatic washer.

**CRITERION MEASURE:**

1. Automated egg gathering equipment is correctly operated, adjusted, and maintained.
2. Eggs are efficiently gathered by hand with minimum breakage.
3. Automated egg washing equipment is properly operated, adjusted, and maintained.
4. Proper egg washing solution is mixed and used.
5. The temperature of the solution during washing is maintained.

SUBJECT AREA: Pullet and Egg Production

**TASK # HHH960:** Grade and candle eggs.

**COMPETENCY:**

1. Grade eggs into weight classes and U. S. Consumer Grades for Shell Eggs.
2. Candle eggs to identify blood spots and checks.

**CRITERION MEASURE:**

1. The minimum net weight per dozen of eggs for the different classes are correctly provided.
2. The standards for the U. S. Consumer Grades for Shell Eggs are correctly listed.
3. Eggs are weighted and correctly labeled into weight classes.
4. Eggs are graded according to U. S. Consumer Grades for Shell Eggs.
5. Eggs are properly candled and blood spots and checks are correctly identified.

**TASK # HHH961:** Record egg production.

**COMPETENCY:** Keep accurate records on egg production using appropriate record charts.

**CRITERION MEASURE:**

1. Appropriate record charts are correctly used to record egg production.
2. Egg production records are accurately kept on a daily basis.

**TASK # HHH962:** Pack eggs for storage and shipment.

**COMPETENCY:**

1. Place eggs in proper cartons by hand and by using automated equipment for storage and shipment.
2. Regulate storage temperature and humidity to keep eggs fresh.

**CRITERION MEASURE:**

1. Eggs are efficiently placed in proper cartons by hand and by correctly using automated equipment.
2. Requirements for optimum storage temperature and humidity for eggs are listed.
3. Storage environment is correctly maintained for keeping eggs fresh.

**TASK # HHH963:** Cull hens.

**COMPETENCY:**

1. List the reasons for culling hens.
2. Cull hens at the proper time by physically examining the birds.

**CRITERION MEASURE:**

1. The reasons for culling hens are correctly listed.
2. Characteristics to look for in separating layers and nonlayers and high and low producers are listed.
3. Nonlaying and low-producing hens are correctly identified and culled from the flock.

**SUBJECT AREA: Management of Poultry Breeding Flock**

**TASK # III964:** Maintain proper hen and rooster ratio.

**COMPETENCY:** Maintain the recommended hen and rooster ratio for flocks.

**CRITERION MEASURE:**

1. The recommended hen and rooster ratio for flocks is correctly listed.
2. The recommended hen and rooster ratio is established and maintained.

**TASK # III965:** Candle and select eggs for hatching.

**COMPETENCY:**

1. List the characteristics for desirable hatching eggs.
2. Candle and select eggs for hatching.

**CRITERION MEASURE:**

1. The internal and external characteristics for desirable hatching eggs are correctly listed.
2. Eggs are correctly candled to identify blood spots and checks.
3. Eggs are selected that have the desirable internal and external characteristics for hatching.

**TASK # III966:** Keep breeding and egg production records.

**COMPETENCY:** Keep accurate breeding and egg production records on appropriate forms.

**CRITERION MEASURE:**

1. Appropriate forms are selected and used for keeping breeding and egg production records.
2. Breeding and egg production data are recorded promptly and accurately.

SUBJECT AREA: Management of Poultry Breeding Flock

**TASK # III967:** Evaluate different breeding programs.

**COMPETENCY:**
1. List and describe the different methods of breeding.
2. Determine the best method or methods of breeding for different poultry operations.

**CRITERION MEASURE:**
1. The different methods of breeding poultry are correctly listed and described.
2. The factors that affect the selection of breeding methods for different operations are listed and discussed.
3. The appropriate breeding method or methods is/are selected for various poultry operations.

**TASK # III968:** Develop appropriate breeding program.

**COMPETENCY:**
1. Develop goals for the breeding program.
2. Determine the factors related to the poultry operation that affect the breeding program.
3. Select the breeding program suitable to the operation.

**CRITERION MEASURE:**
1. The goals for the breeding program are listed and are appropriate for the poultry operation.
2. The factors related to the poultry operation that affect the breeding program are determined.
3. A breeding program is selected that is appropriate to the operation and meets the stated goals.

**TASK # III969:** Determine end of breeding period.

**COMPETENCY:**
1. List and discuss the factors that influence the length of the breeding period of poultry.
2. Determine when poultry are not longer profitable breeders.

**CRITERION MEASURE:**
1. The factors that influence the length of the breeding period of poultry are correctly listed and discussed.
2. Poultry flocks are correctly determined when they are no longer profitable as breeders.

SUBJECT AREA: Poultry Feeds and Feeding

**TASK # JJJ970:** Formulate rations.

**COMPETENCY:**

1. List the factors that are important for the formulation of poultry rations.
2. Formulate rations for different types of poultry by using the trial and error method and the Pearson square method.

**CRITERION MEASURE:**

1. The factors that are important for the formulation of poultry rations are correctly listed and discussed.
2. Different poultry rations are correctly formulated by using the trial and error method and the Pearson square method.

**TASK # JJJ971:** Select, weigh, and mix feeds.

**COMPETENCY:**

1. Select readily available feedstuffs to supply the nutrient requirements for the particular poultry to be fed.
2. Weigh the feedstuffs to obtain the correct amount of each feedstuff required.
3. Thoroughly mix the feedstuffs by hand and by using automated equipment.

**CRITERION MEASURE:**

1. The nutrient requirements for the specified poultry to be fed are determined.
2. Readily available feedstuffs at reasonable costs are selected that will provide the nutrient requirements.
3. Feedstuffs are accurately weighed and the correct amount of each feedstuff is used for the ration.
4. The feedstuffs are thoroughly mixed using hand and automated equipment properly.

**TASK # JJJ972:** Provide proper storage for feed.

**COMPETENCY:** Provide storage for feed that has the correct environmental conditions and is rat proof.

**CRITERION MEASURE:**

1. The required storage conditions for feed are correctly listed.
2. Required feed storage conditions are provided and maintained.

TASK # JJJ973: Calculate feed conversion factors.

COMPETENCY:

1. Weigh the amount of feed fed to a specified flock of poultry for a specified period of time.
2. Measure the amount of weight gain or the egg production over a specified period of time.
3. Calculate feed conversion factor using the data obtained or provided.

CRITERION MEASURE:

1. The feed conversion formulas for weight gain and egg production are correctly provided.
2. The amount of feed fed to a flock of birds over a specified period of time is correctly weighed and recorded.
3. The amount of weight gain and egg production for the flocks over specified periods of time is correctly determined.
4. Feed conversion formulas are correctly used to calculate feed conversion factors for the data obtained.

TASK # JJJ974: Recognize nutritional deficiencies.

COMPETENCY:

1. Determine nutritional requirements for different ages and types of poultry.
2. List the characteristics of nutritional deficiencies in poultry.
3. Observe poultry and correctly identify nutritional deficiencies.

CRITERION MEASURE:

1. Nutritional requirements for different ages and types of poultry are correctly provided by using resource materials.
2. The symptoms or characteristics of nutritional deficiencies are correctly listed.
3. Poultry flocks are observed and nutritional deficiencies are correctly identified.

SUBJECT AREA: Poultry Health

**TASK # KKK975:** Wash and disinfect house and equipment.

**COMPETENCY:**

1. Clean poultry houses and equipment with appropriate solutions using sprayers and other washing equipment.
2. Select correct disinfectants for poultry houses and equipment.
3. Disinfect poultry houses and equipment using sprayers and following recommended procedures.

**CRITERION MEASURE:**

1. Appropriate cleaning solutions and disinfectants are used to clean poultry houses and equipment.
2. After cleaning, poultry houses are free of dirt, manure, and other foreign matter.
3. The requirements for disinfectants working best are correctly listed.
4. Recommended procedures for disinfecting buildings and equipment are followed.
5. The microorganisms are killed that are being treated in poultry houses and on equipment.

**TASK # KKK976:** Maintain dry litter.

**COMPETENCY:** Maintain dry litter in poultry houses by removing soiled litter as needed or periodically and replacing with dry bedding.

**CRITERION MEASURE:**

1. Soiled litter is recognized.
2. Types of good bedding are identified and characteristics are listed and described.
3. Equipment is efficiently and safely used to remove soiled litter and in putting in new bedding.
4. Reasons for maintaining dry bedding are correctly listed.

TASK # KKK977: Chemically treat litter.

COMPETENCY: Apply chemical treatment to litter by correctly operating spray and dust equipment.

CRITERION MEASURE:

1. Reasons for chemically treating litter are correctly listed and discussed.
2. Correct types and solutions are used to chemically treat litter.
3. Spray and dusting equipment is properly used calculated correctly to apply the correct amount of materials to litter.

TASK # KKK978: Properly dispose of litter.

COMPETENCY:

1. List and discuss the methods of disposing poultry litter.
2. Determine the best methods of disposal for different types of poultry operations.

CRITERION MEASURE:

1. The methods of disposing poultry litter are correctly listed and adequately discussed.
2. Factors related to determining the best methods of litter disposal for different types of poultry operations are listed.
3. Appropriate recommendations are made for disposing of litter for specific poultry operations.

TASK # KKK979: Have knowledge of environmental conditions causing health problems.

COMPETENCY: List and discuss the environmental conditions that may contribute to causing health problems in poultry.

CRITERION MEASURE:

1. The environmental conditions that may contribute to causing health problems in poultry are correctly listed and discussed.
2. Improper environmental conditions are correctly identified in poultry houses.

## SUBJECT AREA: Poultry Health

**TASK # KKK980:** Identify disease symptom.

**COMPETENCY:** Identify symptoms of possible diseases in poultry.

**CRITERION MEASURE:** Disease symptoms in poultry are correctly identified and discussed.

**TASK # KKK981:** Detect internal and external parasites.

**COMPETENCY:**

1. Recognize symptoms of parasitism in poultry.
2. Identify internal and external parasites in poultry.

**CRITERION MEASURE:**

1. Types of parasites affecting poultry are listed and discussed.
2. Symptoms of internal and external parasites in poultry are listed and discussed.
3. Poultry flocks are observed and internal and external parasites are identified.

**TASK # KKK982:** Identify disease.

**COMPETENCY:** Identify specific diseases in poultry flocks.

**CRITERION MEASURE:**

1. Symptoms of specific diseases affecting poultry are listed.
2. Symptoms of diseases are analyzed and correct identification of diseases is made.

TASK # KKK983: Isolate infected poultry.

COMPETENCY:
1. Identify poultry infected with diseases and parasites.
2. Remove infected poultry from the flock without disturbing the flock.
3. Place poultry in isolation to prevent spread of the disease.

CRITERION MEASURE:
1. Poultry that have symptoms of disease and parasites are identified.
2. Infected poultry are caught, handled carefully without injury, and the remainder of the flock are not disturbed.
3. Infected poultry are properly placed in isolation and are not released until they are free of disease and parasites.

TASK # KKK984: Put medication in drinking water.

COMPETENCY: Treat various diseases of poultry by adding the correct type and amount of medication in the drinking water.

CRITERION MEASURE:
1. The diseases that may be treated by adding medication to the water are correctly determined.
2. The correct type of medication is used for specific diseases.
3. Directions are carefully followed on all labels of medication including the amount to use, how often to administer, etc.
4. All safety precautions are observed in handling and administering medication.

TASK # KKK985: Administer internal and external parasite treatment.

COMPETENCY: Treat internal and external parasites of poultry by using the recommended type of medication and following directions for treatment.

CRITERION MEASURE:
1. Internal and external parasites that can be controlled by medication are correctly determined.
2. The proper medication is obtained for the identified parasites and it is administered correctly following recommended directions.
3. Dusting and spraying equipment is correctly used to administer medication.
4. All safety precautions are observed in handling and administering medication.

**TASK # KKK986:** Properly store and use different antibiotics for different diseases.

**COMPETENCY:** Safely store and follow label directions for antibiotics used for treating different poultry diseases.

**CRITERION MEASURE:**

1. Storage procedures for antibiotics are correctly determined and followed.
2. Labels on antibiotics are correctly read, interpreted, and followed.

## APPENDIX E

## DEFINITION OF TERMS

For the purpose of clarifying the meanings of specific terms in this project, the following words are defined:

Associate in Applied Science Degree - the award given for the successful completion of a technical education curriculum.

Competency - sufficient judgement, skill, and knowledge to perform a particular task.

Competency-Based Education - the educational process that specifies learning goals in measurable terms and requires that the learner achieve observable behavior changes in knowledge, skill, and/or attitude to demonstrate competency before proceeding to more complex goals.

Competency-Based Instruction - the sequencing and modularization of curriculum into small, manageable units of instruction. The key concept is the student's ability to perform on each segment of the curriculum.

Curriculum - a course or group of courses organized in a logical sequence to meet occupational educational goals.

Curriculum Advisory Committee - a group of local representatives including employees, employers, secondary and postsecondary educators who counsel and advise the institutions regarding the improvement of occupational programs, in an effort to more adequately meet the needs of the community.

Diploma - an award for the successful completion of a course of study 64 to 128 quarter hour credits in length.

Educators - refer to individuals employed in educational institutions and in local, state, or federal agencies, both secondary and postsecondary.

Job Analysis - a detailed listing of tasks currently being performed by workers in a clearly defined, specific job.

Learning Experience - an activity planned by educational institutions whereby the student can practice behavior implied by the objectives.

Occupational Survey - a procedure using mail questionnaires and/or personal interviews to gain knowledge of a community, educational interests or occupational needs to assist in planning.

Skill - the ability to use one's knowledge effectively and readily in execution or performance--dexterity or coordination in the execution of learned physical or mental tasks.

Task - a logically related set of actions required for the completion of a job objective; also a task may be a complete job element.

Task Analysis - a study to determine the steps a worker must know and the key points of knowledge to know in order to perform a given task.

Technical Programs - consist of occupational-oriented courses and general education courses that lead to the awarding of an Associate in Applied Science Degree and prepare students for jobs in paraprofessional fields.

Technical Specialty Programs - Consist of selected technical courses designed to prepare individuals for particular technical skills, and should include only those general education and related courses necessary to support the technical courses offered in the curriculum.

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